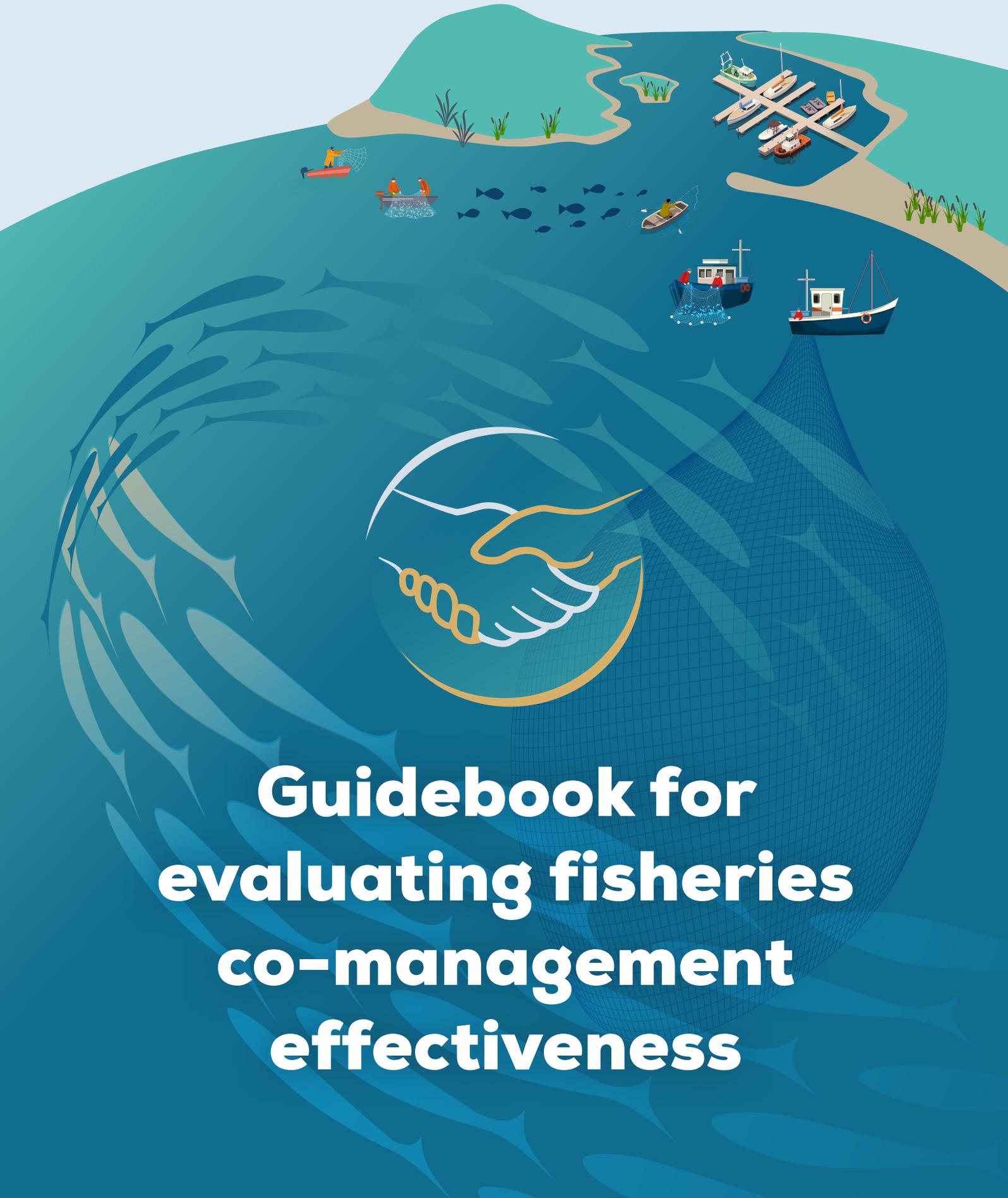




Food and Agriculture
Organization of the
United Nations



Guidebook for evaluating fisheries co-management effectiveness

Guidebook for evaluating fisheries co-management effectiveness

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Abstract

The *Guidebook for evaluating fisheries co-management effectiveness* offers a process and method to evaluate the performance of a fisheries co-management system and its plan in order to enhance its effectiveness in delivering benefits and in contributing to environmental, social and economic sustainability and good governance. It is to be used to evaluate the effectiveness of an existing fisheries co-management system operating at a fishery, community or sector level, or in a spatially defined area. It presents a flexible approach that can be used in many types of fisheries co-management systems with different contexts and characteristics.

The primary audience for the Guidebook is those who commission an evaluation and those who carry out the evaluation. Both of these audiences may include, but not be limited to, government, fishers and other resource users, donors, non-governmental organizations, academic institutions, and research centres and institutes.

The fisheries co-management effectiveness evaluation in the Guidebook is recommended to be undertaken in two separate but complementary parts: evaluating the implementation design and process of the fisheries co-management system, and evaluating the achievements of the goals and objectives that are stated in the fisheries co-management plan.

The process for conducting a fisheries co-management effectiveness evaluation is undertaken in three steps, namely planning, compilation of information, and evaluation. For each step, a set of tasks and activities is presented. A variety of recommended indicators, used in measuring effectiveness, that reflect a diversity of fisheries co-management system good practices, and fisheries co-management plan goals and objectives, are provided.

The evaluation of co-management effectiveness is linked to routine operational monitoring and to adaptive management, a cyclical process of systematically “learning by doing”. The results of the evaluation are used by the co-managers to better understand why goals and objectives and expected impact have or have not been achieved and to adapt co-management design, processes and actions. Evaluation will also improve knowledge of fisheries co-management more generally.

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Abbreviations and acronyms

CCRF	Code of Conduct for Responsible Fisheries
EAF	ecosystem approach to fisheries
IAD	institutional analysis and development
ICLARM	International Centre for Living Aquatic Resources Management
IFM	Institute for Fisheries Management and Coastal Community Development
SDG	Sustainable Development Goal
SES	social–ecological systems
SSF Guidelines	Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication
TURF	territorial use right in fisheries
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

1 Introduction



1. INTRODUCTION

1.1 Purpose and structure of the Guidebook

The *Guidebook for evaluating fisheries co-management effectiveness* (hereafter “the Guidebook”) offers a process and method to evaluate the performance of a fisheries co-management system and its plan in order to enhance its effectiveness in delivering benefits and in contributing to environmental, social and economic sustainability and good governance. While fisheries co-management is more commonly referred to in the context of small-scale fisheries, where it has become a good practice approach to governance, this Guidebook is meant to be useful for all operational scales of fisheries, ranging from small-scale to large-scale activities, whether operating along the coast, in lagoons and offshore, or operating inland, on lakes, rivers, reservoirs, floodplains, permanent or seasonal water bodies. This Guidebook addresses all forms of fisheries, including commercial and recreational fisheries and it presents a flexible approach that can be used in many types of fisheries co-management systems with different contexts and characteristics.

The Guidebook is to be used to evaluate the effectiveness of an existing fisheries co-management system operating at a fishery, community or sector level, or in a spatially defined area. While it can provide relevant insights, it is not designed to be used to evaluate the effectiveness of national legal, policy or institutional frameworks for fisheries co-management. While it can provide relevant insights, it is also not designed to be used to evaluate an entire fisheries management system but focuses instead on the co-management component. The evaluation is determining the performance and impact of the co-management system by assessing the design and functioning of the system itself, and the achievement of the goals and objectives of the related co-management plan.

The evaluation of co-management effectiveness is linked to routine operational monitoring and evaluation undertaken by the co-managers of the fisheries co-management system and to adaptive management, a cyclical process of “learning by doing”. The results of the evaluation can be used to improve the functioning of the system to better achieve the goals and objectives and the impact that the fisheries co-management system is expected to attain. It complements any monitoring and evaluation system that may already be included in a co-management plan. Accordingly, the results can be used to improve knowledge about and the success of fisheries co-management in order to improve overall fisheries management, and societal level governance and human and ecological well-being.

The primary audience for the Guidebook is those who commission an evaluation and those who carry out the evaluation. Both of these audiences may include, but not be limited to, government (at different levels from national to local), fishers and other resource users, donors, non-governmental organizations, research centres/institutes and academic institutions. The Guidebook will also be a useful reference for those conducting monitoring and evaluation of fisheries co-management systems.

1.2 About this Guidebook

This Guidebook consists of five main sections:

- Section 1 is the introduction and describes the purpose of the Guidebook (1.1), FAO and international frameworks related to fisheries co-management (1.2), the reasons for evaluating fisheries co-management effectiveness (1.3), and an overview of the fisheries co-management effectiveness evaluation process (1.4).
- Section 2 presents “What is fisheries co-management?” This includes a discussion on the definition of fisheries co-management (2.1), fisheries co-management good practices (2.2), and a generic model of fisheries co-management (2.3).
- Section 3 presents an overview of the adaptive policy analytical framework that underpins the evaluation of the performance and effectiveness of fisheries co-management systems and how it is applied. This framework is discussed in more detail in Annex 3.
- Section 4 presents the fisheries co-management effectiveness evaluation process. This is a three-step process of: (4.2.1) planning, (4.2.2) compilation of information, and (4.2.3) evaluation. The user is walked through the three steps in the evaluation process.
- Section 5 describes post-evaluation and adaptive management for systematically “learning-by-doing”.
- Annex 1 discusses the standards and good practices that should underpin the evaluation of the performance and effectiveness of the co-management system and proposes indicators that can be used for this assessment.
- Annex 2 provides indicators that can be used for evaluating whether the goals and objectives stated in the fisheries co-management plan have been achieved. A brief description of each indicator, data collection method and how to analyse and interpret the results is provided.
- Annex 3 describes the institutional analysis framework that underpins the evaluation process.
- Annex 4 presents attributes relevant to describing the context of the fisheries co-management system.

Box 1. Supplementary guidance

This Guidebook is supported by three other products:¹ (1) a compilation of case studies illustrating fisheries co-management and the application of the Guidebook; (2) a toolbox with methods and approaches, and; (3) an e-learning course to support the use of this Guidebook.

Source: Author’s own elaboration.

¹ In preparation.

1.3 International frameworks related to fisheries co-management

Interest in fisheries co-management has grown as a response to the need to find more effective ways for fisheries management to address overfishing because top-down, centralized management has failed in many instances to ensure sustainability. Sustainable and productive fisheries improve food security and nutrition, increase income and improve livelihoods and promote economic growth. Co-management builds on decentralization of decision-making and participation and hence can contribute to equitable governance outcomes. Effective co-management will contribute to the achievement of the Sustainable Development Goals (SDGs), in particular SDG 14 on the sustainable use of oceans, but also other goals related to poverty eradication (SDG 1), food security (SDG 2), gender equality (SDG 5), decent work and economic growth (SDG 8) and partnerships for sustainable development (SDG 17).

Already before the 2030 Agenda for Sustainable Development with the SDGs was established, FAO members had agreed on a framework for sustainable fisheries through the 1995 Code of Conduct for Responsible Fisheries (CCRF). This international instrument remains a widely used reference framework for fisheries governance and management and continues to guide FAO's work on fisheries and aquaculture. It contains a number of sections related to the principles of fisheries co-management and recommends that states should:

Facilitate consultation and the effective participation of industry, fishworkers, environmental and other interested organizations in decision-making with respect to the development of laws and policies related to fisheries management, development, international lending and aid (FAO, 1995, p. 6)

and also that: States should seek to identify relevant domestic parties having a legitimate interest in the use and management of fisheries resources and establish arrangements for consulting them to gain their collaboration in achieving responsible fisheries (FAO, 1995, p. 8).

Fisheries co-management (via participation) is also a central principle of an ecosystem approach to fisheries (EAF), a framework developed for operationalizing the CCRF that takes into account the three foundational pillars of an ecosystem approach to fisheries—human well-being, ecological well-being and good governance.

The importance with which FAO members regard the principles of consultation and participation underpinning co-management is reflected in the endorsement by FAO governing bodies of two additional instruments: the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) in 2012 and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) in 2014. Both these instruments have consultation and participation among their guiding principles, e.g. No. 6 of the VGGT:

3B.6. Consultation and participation: engaging with and seeking the support of those who, having legitimate tenure rights, could be affected by decisions, prior to decisions being taken, and responding to their contributions; taking into consideration existing power imbalances between different parties and ensuring active, free, effective, meaningful and informed participation of individuals and groups in associated decision-making processes (FAO, 2012, p. 5).

The SSF Guidelines make specific reference to co-management in the context of governance of small-scale fisheries tenure and resource management:

- 5.15 States should facilitate, train and support small-scale fishing communities to participate in and take responsibility for, taking into consideration their legitimate tenure rights and system, the management of the resources on which they depend for their well-being and that are traditionally used for their livelihoods. Accordingly, States should involve small-scale fishing communities – with special attention to equitable participation of women, vulnerable and marginalized groups – in the design, planning and, as appropriate, implementation of management measures, including protected areas, affecting their livelihood options. Participatory management systems, such as co-management, should be promoted in accordance with national law (FAO, 2015, p. 7).
- 5.17 States should ensure that the roles and responsibilities within the context of co-management arrangements of concerned parties and stakeholders are clarified and agreed through a participatory and legally supported process. All parties are responsible for assuming the management roles agreed to. All endeavors should be made so that small-scale fisheries are represented in relevant local and national professional associations and fisheries bodies and actively take part in relevant decision-making and fisheries policymaking processes (FAO, 2015, p. 7).
- 5.18 States and small-scale fisheries actors should encourage and support the role and involvement of both men and women, whether engaged in pre-harvest, harvest or post-harvest operations, in the context of co-management and in the promotion of responsible fisheries, contributing their particular knowledge, perspectives and needs. All parties should pay specific attention to the need to ensure equitable participation of women, designing special measures to achieve this objective (FAO, 2015, p. 7).

The use of this Guidebook supports the implementation of the VGGT and when applied in the context of small-scale fisheries the SSF Guidelines by improving the effectiveness of fisheries co-management in the context of governance of tenure and in fisheries. Effective co-management systems, including local participation, empowerment and strengthened institutional capacity, are all key ingredients of responsible governance of tenure. Carrying out evaluations as proposed by the Guidebook will also support improved knowledge on co-management that will strengthen future co-management systems. In the context of small-scale fisheries, this will support the implementation of the SSF Guidelines with regard to ensuring active, free, effective, meaningful and informed participation of small-scale fishing communities, including Indigenous Peoples, in the whole decision-making process related to fishery resources. Both the VGGT and the SSF Guidelines promote a human rights-based approach including the empowerment of fishing communities, both men and women, to participate in decision-making and to assume responsibilities for the sustainable use of fishery resources.

1.4 Why evaluate fisheries co-management effectiveness?

Effective fisheries co-management requires continuous feedback of information in order to achieve goals and objectives and bring about positive impacts using less resources (human, financial and environmental). Monitoring and evaluation consist of reviewing the results of actions taken, generating lessons for learning, assessing whether or not existing systems and actions are producing the desired outcomes, and adapting the co-management system in order to revise or improve practices. Evaluations are conducted to assess, among other purposes, the effectiveness of plans and strategies, diagnose implementation problems, make adjustments in strategies, and make decisions about adaptive management. Evaluations are also used to review if the appropriate systems and processes are used to set objectives and carry out activities. The assumptions on which current ways of doing things and activities are based are tested to determine which processes and activities worked and which did not, and why. Decisions about necessary modifications to the system, processes and activities are made and, if so, what changes are needed and who should carry them out.

The evaluation of co-management effectiveness is linked to routine operational monitoring and to adaptive management, a cyclical process of systematically “learning by doing”. Monitoring is part of the co-management process and is something that co-managers do on a daily basis. A fisheries co-management effectiveness evaluation builds on and links to existing monitoring routines by providing a way to periodically formally step back and reflect on the cumulative results of their efforts. The evaluation of co-management effectiveness provides a formal way to learn from what has and has not worked well and for people to understand how and why co-management practices are being adapted. The evaluation of the effectiveness of a fisheries co-management system is for the purposes of adaptive management.

The fisheries co-management effectiveness evaluation is recommended to be undertaken in two separate but complementary parts:

1. Evaluating the implementation design and process of the fisheries co-management system, i.e. how well the fisheries co-management system was developed and how well it functions compared to existing good practices; and
2. Evaluating the achievements of the goals and objectives that are stated in the fisheries co-management plan. The evaluation assesses performance and effectiveness against a set of criteria and standards, expressed as indicators.

The evaluation of co-management effectiveness may be considered to be difficult, excessively technical and costly. While this can be true, this Guidebook presents an evaluation that can be flexible and undertaken within the needs and resource constraints in any fisheries co-management system. Both parts above do not have to be conducted. Part 1 is undertaken to evaluate the fisheries co-management system, while Part 2 is undertaken to evaluate the fisheries co-management plan. However, it is recommended that both parts be undertaken as they complement each other with information that can provide a deeper understanding of the effectiveness of the fisheries co-management

system. Not every task presented below needs to be conducted and not every indicator presented needs to be measured. A co-management effectiveness evaluation can be kept simple, measuring only a few key aspects and indicators. However, understanding which are the critical indicators to retain requires an appreciation of the entire evaluation approach and process. Experience, needs and resources may allow additional indicators to be measured in subsequent evaluations.

1.5 Overview of the fisheries co-management effectiveness evaluation process

A co-management effectiveness evaluation may be initiated internally within the fisheries co-management system by the co-managers, or may be initiated externally by different stakeholders to the fisheries co-management system, such as the resource users or community, a donor or a government fisheries agency. In either case, the purpose of initiating the evaluation is the same, that is, to assess how well the fisheries co-management system is achieving its goals and objectives.

It is recommended that an evaluation team be established, made up of people with the interest and skills to conduct the scale of evaluation that is desired with the resources (funds, time, people, knowledge and experience) available. Evaluations should be participatory and involve resource users and primary stakeholders in the design, data collection and analysis. At a minimum, the co-managers, representing resource users and the fishing community and other relevant actors, and the government of the fisheries co-management system, should be involved in the evaluation. It is also important to ensure that there is adequate representation of both men and woman, and youth and Indigenous Peoples.

The evaluation process is undertaken in three steps:

Step 1	Planning: tasks needed to prepare to undertake the evaluation;
Step 2	Compilation of information: description of the context and of the fisheries co-management system design and process; and
Step 3	Evaluation: implementing the evaluation and analysing data, and validating and communicating results.

After the evaluation, the results are used by the co-managers to better understand why goals and objectives and expected impact have or have not been achieved, and to adapt co-management design, processes and actions. The evaluation will also improve knowledge of fisheries co-management more generally.

The frequency for conducting an effectiveness evaluation will depend upon whether there has been sufficient time elapsed to conclude confidently that measurable change can be observed as a result of the implementation of management plan actions. Measurable change occurring as a consequence of management action may take time to manifest and observe, even years. It is recommended that an effectiveness evaluation be conducted every three to five years, or linked to revisions of the co-management plan. This will allow time for adjustments in co-management design and processes, and for the fisheries co-management plan activities to be implemented.

2 What is fisheries co-management?



2. WHAT IS FISHERIES CO-MANAGEMENT?

2.1 Definition of fisheries co-management

Fisheries co-management is now a widely accepted approach to fisheries governance. There is no single definition for fisheries co-management as the concept is broad. The following definition will be used in this Guidebook:²

Fisheries co-management is defined as a partnership arrangement in which the community of local resource users (fishers) and government, with support and assistance as needed from other stakeholders (boat owners, fish traders, fish processors, boat builders, business people, etc.), and external agents (non-governmental organizations, academic and research institutions), share the responsibility and authority for the management of the fishery (Berkes *et al.*, 2001).

Fisheries co-management is a process of fisheries governance; maturing, adjusting and adapting to changing conditions over time. Fisheries co-management can serve as a mechanism for power sharing, institution building, enhanced trust and social capital, problem solving, knowledge-sharing, social learning, collaborative opportunities and encouraging collective action. Co-management is seen by many as a normative process to improve the legitimacy and effectiveness of resource management.

Fisheries co-management is a central principle of sustainability and the EAF. It takes into account the three foundational pillars of an EAF – human well-being, ecological well-being and good governance.

Fisheries co-management therefore differs conceptually from fisheries management. While complementary and linked, they differ in their objective. Fishery co-management is fundamentally about governance – the focus is on the prefix “co-”, the process by which individuals and institutions interact to make collective decisions on managing their fisheries. Fisheries management, as defined by FAO, is:

The integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives (FAO, 1997).

² This definition is also included in the fisheries glossary of the FAO Term Portal, available at www.fao.org/faoterm/en

This Guidebook is about the management effectiveness evaluation of an existing fisheries co-management system and its associated plan, not a fisheries management system and plan. A fishery management plan might include operational details like how many days of fishing and what mesh size are permitted in the fishery. Those details might have been developed through co-management. But the fisheries management plan differs from the “co-management plan” which is a governance-oriented plan about such activities as participation and engagement that should take place in the fishery, e.g. how many meetings of co-managers per year. Similarly, a goal of a fishery management plan may be healthy fish stocks, whereas a goal of co-management may be a level of participation that leads to contentment among stakeholders. Much has been written elsewhere about the evaluation of fisheries management systems.

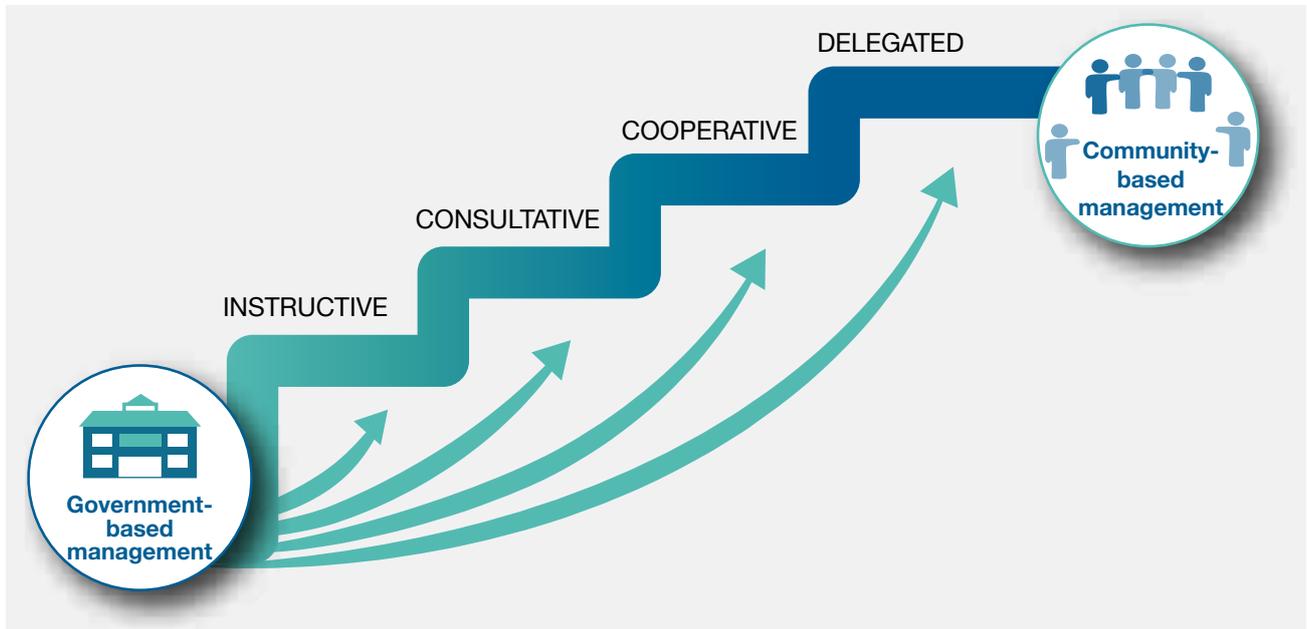
A fisheries co-management system is a governance arrangement by which individuals and institutions interact to make collective decisions on managing their fisheries, i.e. specifically about who shares in each aspect of fishery management, and within what institutional arrangements, and thus about the collaborative partnerships created for fishery decision-making. A fisheries co-management process is a set of activities to plan and implement a fisheries co-management system, for example, community organizing and setting goals and objectives.

Fisheries co-management is based on a minimum of two governance actors – resource users/user-groups/fishing communities and government. Government provides the legislative and legal rights and authority for fisheries co-management and the conditions for co-management to operate. The resource users/user-groups/fishing communities operationalize these rights and authorities in establishing organizational and institutional arrangements of fisheries co-management.

There is a continuum of possible co-management arrangements covering various partnership arrangements and degrees of power-sharing and integration of local (informal, traditional and customary) and centralized government fisheries management systems. Fisheries co-management can be classified into several broad types according to the roles government and user groups/fishing communities play (Sen and Nielsen, 1996) (Figure 1):

- Instructive: a mechanism exists for dialogue with user-groups/fishing communities but the process itself tends to be government informing fishers on the decisions they plan to make.
- Consultative: institutional structures for government to consult with user-groups/fishing communities exist, but all decisions are taken by government.
- Cooperative: government and user-groups/fishing communities cooperate together as equal partners in decision-making.
- Delegated: management authority is delegated to user-groups/fishing communities and government is informed of decisions taken.

Figure 1. Types of fisheries co-management



Source: adapted from Sen, S. and Nielsen, J.R. 1996. Fisheries co-management: a comparative analysis. *Marine Policy*, 20(5): 405–418.

Fisheries co-management may be implemented for a specific fishery or user group (i.e. gear type or target species) or a fishing community³, real or virtual.

The potential advantages of co-management include:

- a more transparent, accountable and autonomous management system;
- a more democratic and participatory system;
- improved stewardship of aquatic and coastal resources and management;
- localized solutions to local problems and opportunities;
- a higher degree of acceptability, legitimacy and compliance to plans and regulations;
- and
- improved coordination and communication among all partners.

The potential disadvantages of co-management include:

- It may not be suitable for every fishing community as many communities may not be willing or able to take on the responsibility of co-management.
- Leadership and appropriate local institutions, such as fisher organizations, may not exist within the community to initiate or sustain co-management efforts.
- In the short term, there are high initial investments of time, financial resources and human resources to establish co-management.

³ A fishing community is a community that is substantially dependent on, or substantially engaged in, the harvest or processing of fishery resources to meet social and economic needs; the fishing vessel owners, operators, crew and fish processors that are based in such a community (OECD, 2007).

- For many individuals and communities, the incentive(s) – economic, social and/or political – to engage in co-management may not be present.
- The risks involved in changing fisheries management strategies may be too high for some communities and fishers.
- The costs for individuals to participate in co-management strategies (time and money) may outweigh the expected benefits.
- Sufficient political will may not exist to support co-management.
- It may not be suitable for all types of fisheries, such as transboundary fisheries for migratory fish species.
- Governments may see co-management arrangements as a means of reducing cost, by devolving responsibilities to other stakeholders (for instance, data collection or enforcement).

2.2 Fisheries co-management good practices

There is no one model and process for fisheries co-management. Referring to the discussion in Section 2.1 above, there is a continuum of types of co-management arrangements. However, global experiences and reviews have shown that a well-functioning co-management system is usually one based on extensive cooperation and delegated management authorities. A number of success factors and good practices for fisheries co-management have been identified.⁴ These good practices can be seen as a foundation for successful co-management that creates benefits and contributes to sustainable development and good governance. They can be categorized as referring to the external enabling environment, the internal attributes of the co-management system itself and to the individual co-management participants (Figure 2). They also relate closely to principles underpinning the VGGT and the SSF Guidelines mentioned above and to general good governance principles. A summary of the most commonly reported success factors and good practices, sorted by broad categories (Figure 3), include:

1. **Enabling environment good practices (those that are external to the fisheries co-management system):**
 - Enabling policies and legislation for fisheries co-management: supportive legislation, policies, rights and authority structures are in place;
 - Tenure rights of the co-managed fishery resources: formal and recognized rights to the fishery resources are granted to the co-management unit and defined mechanisms (economic, administrative and collective) and the structures required for allocating use rights among co-management participants are in place;
 - Authority of government on the right to organize and make management rules: resource users have a legal right to organize and make rules; and
 - Support of government and political/economic elites: active cooperation and power sharing with resource user.

⁴ See, for example, Pomeroy *et al.*, 1997; Pomeroy, Katon and Harkes, 2001; Pomeroy, Cinner and Nielsen, 2011; Evans, Cherrett and Pemsil, 2011; Gutiérrez, Hilborn and Defeo, 2011; d'Armengol *et al.*, 2018.

2. Co-management system good practices (those found within the co-management system):

a) Accountability and transparency:

- Membership and rights clearly defined: individual fishers, households or companies with rights to fish in a bounded fishing area, to participate in management and to be an organization member are clearly defined;
- Conflict management mechanisms: existence of a mechanism to address conflict;
- Accountability: co-management conducted in an equitable, open and transparent manner; and
- Leadership: existence of a singular individual with entrepreneurial skills, highly motivated, legitimate and respected as a local leader.

b) Feasibility and performance:

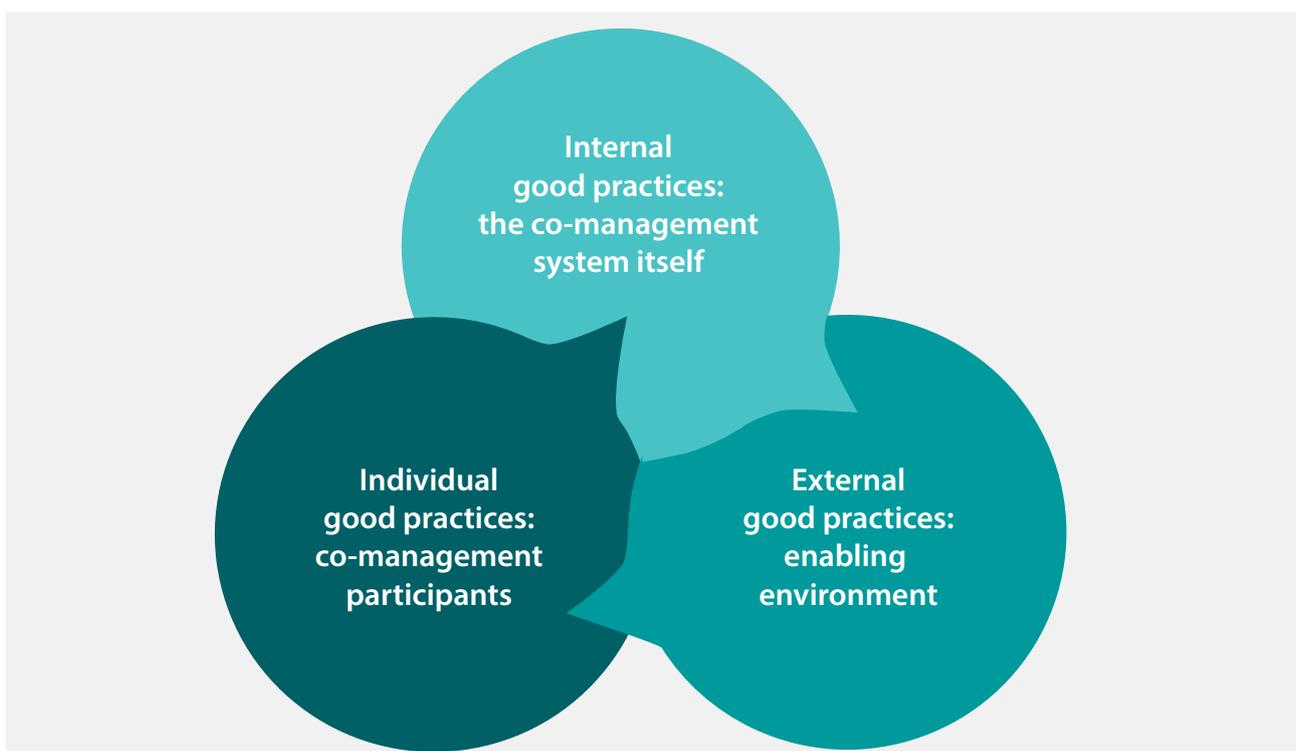
- Appropriate scale: scale may vary but should be appropriate to the area's ecology, people and level of management;
- Defined boundaries of the co-management system;
- Regular interaction: regular, active and participatory meetings of co-management partners to serve as a forum for discussion, power-sharing and trust building;
- Adequate financial resources/budget: existence of a financial sustainability mechanism;
- Co-management plan: existence of a co-management plan developed and agreed by resource user groups/co-management participants through a participatory mechanism;
- Clear goals and objectives from a well-defined set of issues: clarity and simplicity of goals and objectives to steer the direction of co-management;
- Knowledge of resource: resource is one of which stakeholders have a good knowledge and there is recognition of traditional knowledge;
- Monitoring and evaluation system: participatory, indicators, targets and baselines;
- Adaptive management: a focus on systematic learning-by-doing; and
- Mutually beneficial alliances and networks: communication and connectedness among various resource user groups and stakeholders.

c) Participation and equity:

- Participation by those affected: most individuals affected by co-management arrangements are included in the group that makes decisions about and can change the arrangements;
- Group/social cohesion: similar characteristics in terms of kinship, norms, trust, fishing gear type, etc. among the resource users;
- Empowerment, capacity building and social preparation: activities for individual and resource user group empowerment and skills development to actively participate in co-management;
- Coordination: forum (meeting or assembly) for cooperation between government and resource users;

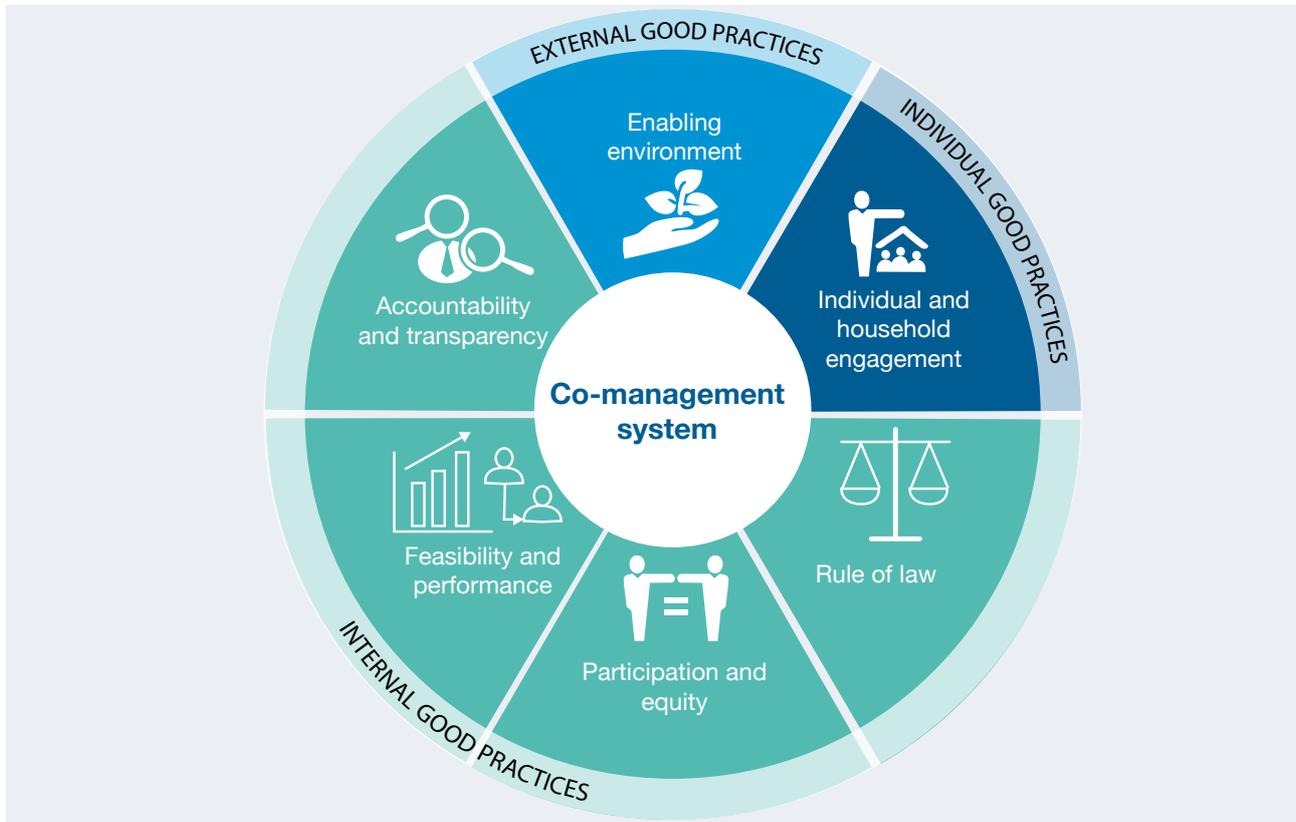
- Community organizations: existence of a legitimate (as recognized by the local people) community or people's organization for representing resource users and other stakeholders in decision-making;
 - Equity: equal opportunity and fair access to the fishery among the various resource users and between different user groups; and
 - Inclusiveness: recognition and involvement of different resource users and community members, including youth, women, Indigenous Peoples and others with a stake in the future of the fishery.
- d) **Rule of law:**
- Congruence: scale and scope of rules are appropriate to local conditions;
 - Management rules enforced: self-enforcement system of penalties imposed by strong operational rules designed, enforced and controlled by local users; and
 - Graduated sanctions: sanctions increase with the number or the severity of offences.
3. **Individual and household level good practices (individual and household engagement in co-management):**
- Individual incentive structure: economic, social and political incentive structure that induces individuals to participate in co-management.

Figure 2. The different dimensions of co-management good practices



Source: Authors' own elaboration.

Figure 3. Broad categories of good practices



Source: Authors' own elaboration.

2.3 Generic model of fisheries co-management

There is no one model or process of fisheries co-management. Each location where fisheries co-management is implemented has its own unique context and characteristics that make using a “blueprint” model of fisheries co-management difficult. However, experience has shown that the design, development and implementation of fisheries co-management commonly follows a process of phases and activities. What is presented is a “generic” process not “the” process. As is hopefully clear, there is no “the” process because each situation where fisheries co-management may be implemented will be different. There is a range of activities and approaches that can be used in planning and implementing a fisheries co-management programme. A generic model or process of the implementation of fisheries co-management can be viewed as having three phases: (1) “beginning” or pre-implementation, (2) implementation, and (3) post-implementation or fisheries co-management system sustainability. Within each of the three phases there are a number of activities that can be undertaken. For example, pre-implementation often has community meetings; implementation often has capacity development and agreements between co-managers; and post-implementation often has evaluation.

Ideal types of activities undertaken for each of the three phases of a generic model process for implementation of a fisheries co-management system are presented in Figure 4 (recognizing that these activities may occur in different sequence and that there may be other activities, depending upon the fishery and community).

Figure 4. Ideal types of activities in a co-management implementation process



Source: Authors' own elaboration.

3 The adaptive analytical framework



3. THE ADAPTIVE ANALYTICAL FRAMEWORK

An analytical framework helps organize an analysis, such as evaluating the performance of fisheries co-management systems. It provides a common analytical structure which will enable data to be analysed in a systematic way and allow generalizations and comparisons to be made. A framework is thus useful in providing a common set of potentially relevant variables (attributes) and indicators and their subcomponents to use in the design of data collection and the analysis of findings about fisheries co-management systems.

Two interrelated frameworks that are useful in the context of co-management effectiveness evaluation are the institutional analysis and development (IAD) framework and the social-ecological systems framework. The IAD framework was developed at the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis at Indiana University beginning in the early 1980s (Ostrom, 1990; McGinnis, 2000, 2011; Ostrom, 2005, 2011; Poteete, Janssen and Ostrom, 2010). The social-ecological systems (SES) framework builds on the foundation of the IAD framework, and the two are very closely related. Ostrom's (2009) framework for analysing social-ecological systems involves four core systems and a large number of variables falling under the core systems. Ostrom's framework (McGinnis and Ostrom, 2014; Ostrom, 2009, 2007) provides a coherent and robust set of variables to analyse how attributes of a resource system – the resource units, the users and the governance system – affect interactions and resulting outcomes (d'Armenegol *et al.*, 2018). These frameworks are explained in more detail in Annex 3.

For the purpose of this Guidebook, a simplified version of Ostrom's framework has been developed. The practical operationalization of the framework involves: 1) collecting information on context and the co-management process (Figure 5), 2) measuring indicators, and 3) analysing and understanding linkages and relationships between and among the elements of the fisheries co-management system – context, process, system functions and evaluation results. Each element of the co-management system has a causal relationship with other parts, some stronger and some weaker, depending upon patterns of interactions. Different combinations of these elements can be examined depending upon the situation. Rather than seeking to prove “cause and effect” relationships, the analysis focuses on the “explanatory power” of all the elements in the co-management system and considering how the result can be best explained.

An example of the application of the framework to an evaluation of a fisheries co-management system is presented in Section 4.2.3 (Task 3.4) below on analysis of data.

Figure 5. The adaptive analytical framework



Source: adapted from Ostrom, E. 2009. A general framework for analysing sustainability of social-ecological systems. *Science*, 325(5939): 419–422.

4 The fisheries co-management effectiveness evaluation process



4. THE FISHERIES CO-MANAGEMENT EFFECTIVENESS EVALUATION PROCESS

4.1 Introduction

This section of the Guidebook will outline the process for conducting a fisheries co-management effectiveness evaluation. There are three steps in the fisheries co-management effectiveness evaluation process: (1) planning, (2) compilation of information, and (3) evaluation.

The evaluation is undertaken in two separate but complementary parts (Figure 6):

Part 1 – Evaluation of the co-management implementation process focusing on the standard of management within the fisheries co-management system at government and community levels, i.e. how well the fisheries co-management system was developed and how well it functions against good practices of co-management.

Part 2 – Evaluation of the achievement of goals and objectives as stated in the fisheries co-management plan at the community level. The evaluation assesses performance and effectiveness against a set of criteria and standards, expressed as indicators.

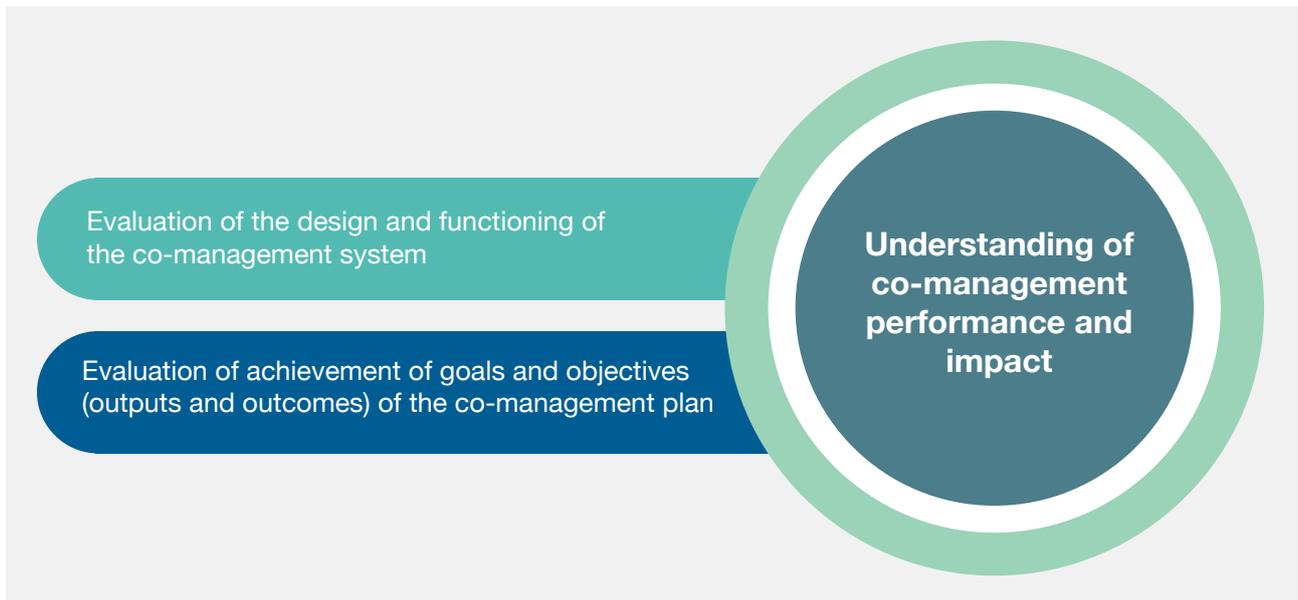
As mentioned above, both parts of the evaluation do not have to be conducted (Figure 7). Part 1 is undertaken to evaluate the fisheries co-management system, while Part 2 is undertaken to evaluate the fisheries co-management plan. However, it is recommended that both parts be undertaken as they complement each other with information that can provide a deeper understanding of the effectiveness of the fisheries co-management system.

To conduct a co-management effectiveness evaluation, it is recommended that your fisheries co-management system should meet the following minimum requirements:

- the fisheries co-management system has been in operation for at least two years; and
- there is a written fisheries co-management plan including clearly stated goals and objectives.

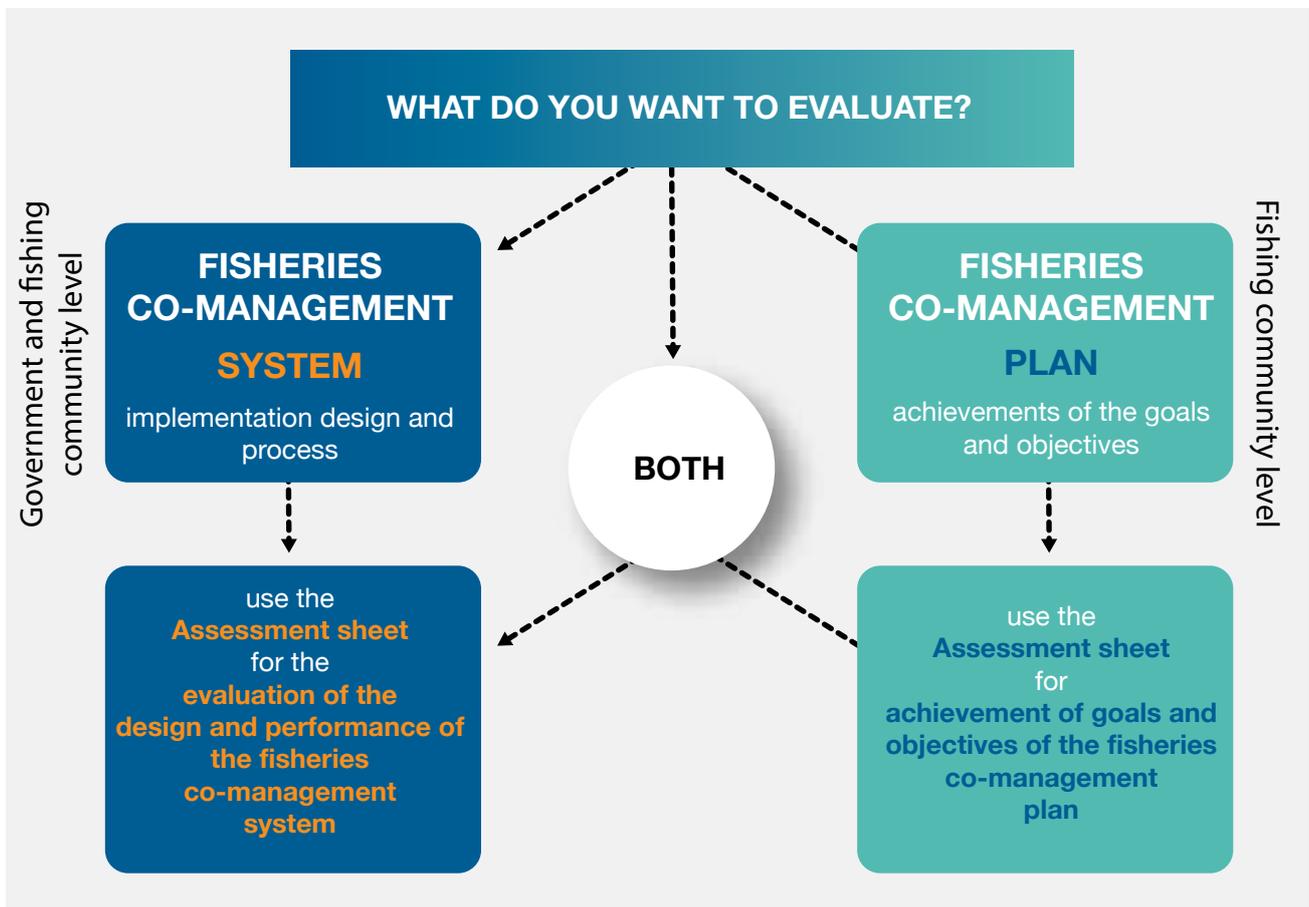
If the fisheries co-management system does not meet these minimum requirements, it is still possible to conduct an evaluation if there are fully agreed, if not explicitly stated in writing, goals and objectives available, even if they are not part of a full fisheries co-management plan. The evaluation of the co-management system good practices can still be conducted. However, if no goals and objectives are available, they should be developed in a participatory manner with fisheries co-management stakeholders, based on the values and practices that have become institutionalized, before an effectiveness evaluation is initiated, as they are central to the evaluation process.

Figure 6. The two parts of a co-management evaluation process



Source: Authors' own elaboration.

Figure 7. What do you want to evaluate?



Source: Authors' own elaboration.

4.2 Evaluation process

The fisheries co-management effectiveness evaluation process is undertaken in three steps (Figure 8):

Figure 8. The evaluation process steps



Source: Authors' own elaboration.

Each step is described in detail and a set of tasks and activities to complete each step is presented and discussed.

Box 2. Key steps and tasks for a simplified co-management evaluation

The steps, tasks and activities described below may seem complex. It is necessary to present this level of detail so that users of the Guidebook will have instruction on how to plan for and undertake the co-management evaluation. However, at the core of the evaluation are five tasks that are central to conducting a fisheries co-management effectiveness evaluation. An evaluation can be conducted based on these five tasks which are:

1. Identify (i) key criteria (related to the success factors and good practices presented in Section 2.3 above) to use as the basis of the co-management system evaluation, and (ii) the fisheries co-management plan and its goals and objectives (Task 1.8);
2. Select the indicators (Task 1.10);
3. Measure the indicators (Task 3.2);
4. Analyse the results (Task 3.4); and
5. Communicate the results (Task 3.6).

While these five core tasks are central to conducting an evaluation, it is highly recommended that the Guidebook user review all the steps, tasks and activities so that they fully understand how to plan, conduct and use the results of a fisheries co-management effectiveness evaluation.

Source: Authors' own elaboration.

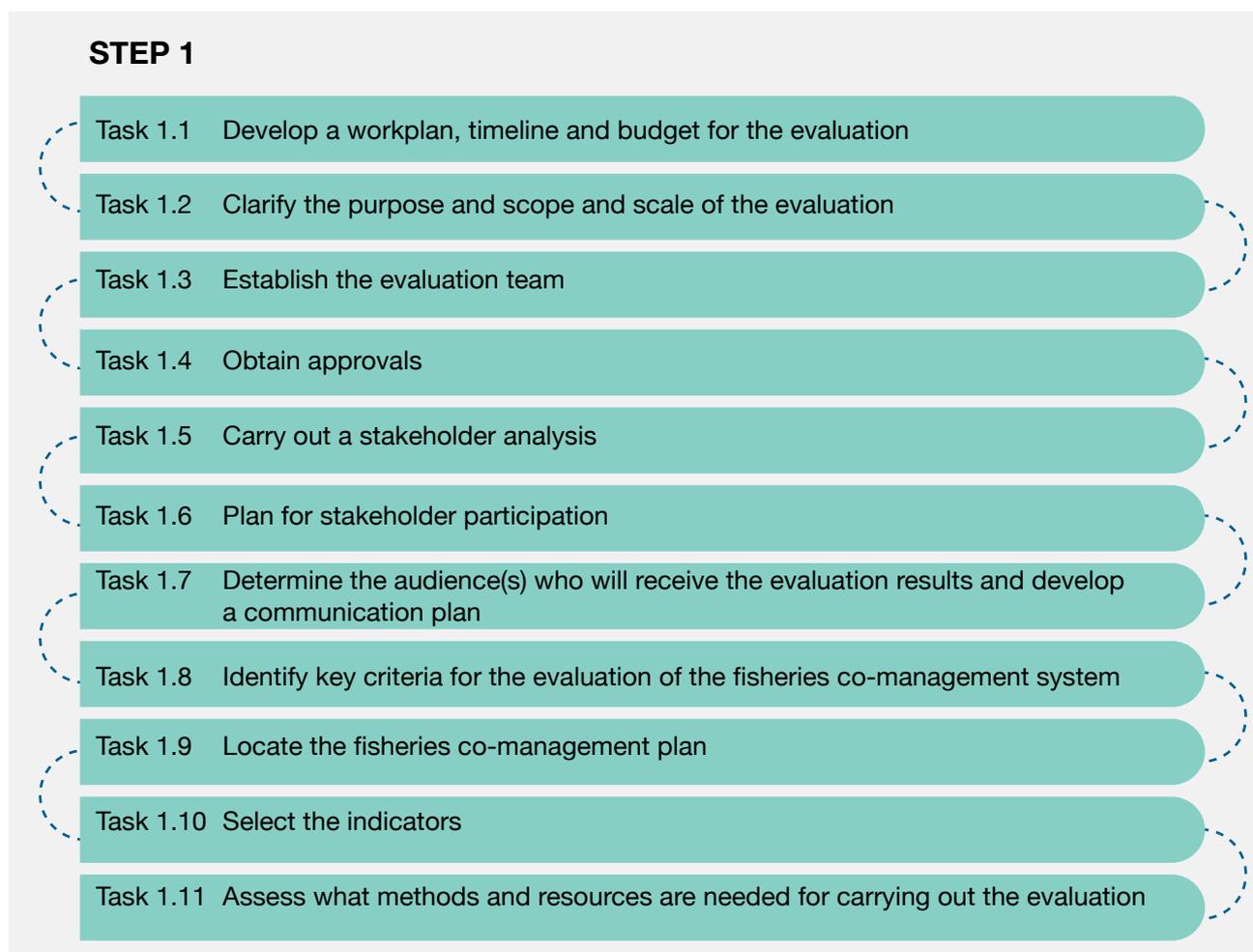
4.2.1 Step 1: Planning

Planning involves the tasks needed to prepare for the evaluation. Planning for an evaluation should clearly and concisely answer nine questions:

- What resources (human and financial) are needed to carry out the evaluation?
- What is the timeline for carrying out the evaluation?
- Why is the evaluation being done, how are results going to be used and what is its scope and scale?
- Who should be on the evaluation team?
- What formal approvals and arrangements are needed for carrying out the evaluation?
- Who are the key stakeholders to be involved in the evaluation?
- How can appropriate participation be ensured?
- What are the parameters to be evaluated?
- Who is the audience for the evaluation results and how are results going to be communicated?

To answer these questions, it is suggested to carry out the following 11 tasks (Figure 9).

Figure 9. Tasks of Step 1



Source: Authors' own elaboration.



Task 1.1: Develop a workplan, timeline and budget for the evaluation

A workplan with a timeline and budget should be prepared for the evaluation, identifying specific activities and time periods for starting and completing those activities. Alternatively, consider how much time and/or budget is available to conduct the evaluation and organize the specific activities accordingly. A timeline can also provide a means to set up targets and milestones to accomplish along the way.

The amount of time required for and the cost of each activity will depend on the number of indicators selected, the size of the fisheries co-management area, the complexity of the fisheries system and choice of methods. Consider the costs at the same time as considering the indicators. Consider which indicators have similar methodologies, such as a survey that could be used for several indicators. Also, consider which of these methods are included in existing monitoring programmes of the co-management system. Consider the amount of data that needs to be collected. This will partly depend on internal and external audience needs and on the type of data being collected. Determine when the data needs to be collected. Consider factors such as seasonality and frequency.

Estimate the budget that will be needed for the evaluation. For example:

- What is the cost of the evaluation team's time?
- How much are the evaluator(s) and training costs?
- What is the cost of collecting the data on each indicator?
- What are the equipment and other capital costs?

Assess the available human resources, equipment and budget; if they are insufficient, develop a plan to secure funds. Secure additional resources as necessary.

Pull together all the components into an evaluation workplan. A workplan outlines the approach and a set of activities to be undertaken during the evaluation, the sequence of activities, and the individual team member responsibilities/tasks for each activity. The workplan should set forth as precisely as possible what activities will be undertaken, by whom, the timeline, and under what budget. The evaluation workplan should describe which analyses will be done with what data and by whom. Distribute the evaluation workplan to the evaluation team.



Task 1.2: Clarify the purpose and scope and scale of the evaluation

This Guidebook is based on there being two basic purposes for conducting the evaluation: (i) determining the appropriateness of the co-management system and process and (ii) the achievement of co-management plan goals and objectives. The information generated by the evaluation will be used to adapt and improve the co-management system's process, management, planning, accountability and overall impact. However, within this overall framework, there may be more specific reasons for conducting the evaluation. Perhaps there are already problems or issues that have been noticed. Donors and government policymakers may need a review to highlight problems and to set priorities; or to promote better management policies and practices more generally. Leaders of the co-management

system may wish to use evaluation results to improve their performance or to report on achievements. Increased interest in evaluation is in part due to increased demand for accountability and transparency. Broadly speaking, an evaluation can:

- provide direction for the achievement of goals and objectives;
- enable and support an adaptive approach to management;
- assist in effective resource allocation;
- promote accountability and transparency; and
- help involve the resource users and stakeholders.

Those initiating and commissioning the evaluation and stakeholders should be clear about the purpose of conducting the evaluation and identify what specific questions they would like the evaluation to provide answers to. This will allow all those involved with the fisheries co-management system and those in the evaluation team to understand and agree on why the evaluation is being done. Moreover, the co-management system management unit that is being evaluated needs to be clearly defined. It may be a system operating at a fishery, community or sector level, or a spatially defined area (e.g. a territorial use right in fisheries or “TURF”).

The scale of the evaluation is identified as the fishery/community(s)/sector boundaries and domain under the co-management system. This should be available from the fisheries co-management plan. It allows the evaluation process to have a defined area or domain to undertake the evaluation and to determine the stakeholders who are involved in the co-management system.



Task 1.3: Establish the evaluation team

The evaluation team is responsible for planning, implementation and analysis. There should be an individual appointed to lead the evaluation team. The expertise required for the evaluation team will depend upon the indicators selected and the level of complexity of measuring and analysing the indicator. Building the capacity of the team members to conduct the evaluation should be done at least several months in advance of the evaluation. Depending on the purpose of the evaluation, its scope and the resources available, the evaluation may be conducted by a team composed of people internal to the fisheries co-management system and/or people external (outside experts) to the fisheries co-management system. Bringing in external experts, who demonstrate an understanding of the co-management system and are trusted and respected, can enhance the capacity of the evaluation team. There may, for example, be a need for a gender specialist. The evaluation team should agree on a set of rules, principles and approaches to guide the evaluation process. The responsibilities of each team member should be specified based on their skills and experience. The evaluation team should be legitimized by primary user groups/rights holders, fishing community members and the government. In some cases, particularly with large evaluation teams who are charged with measuring many indicators, there may need to be a full-time logistical officer.

Identify a member of the evaluation team to be the “data manager” who will receive all the collected data for each selected indicator. In some cases, this may be the evaluation team leader, or perhaps the same person collecting the relevant information (e.g. the team socioeconomist). In other cases, there may be a person who is responsible for receiving and handling information, such as a data analyst or a computer specialist.



Task 1.4: Obtain approvals

Approvals may need to be obtained from different levels of government and local community officials and leaders to undertake the evaluation. Government regulations may also exist to guide the evaluation and should be identified and reviewed. Ensure that all the necessary permits, approvals and permissions are in place to conduct all the work required for the evaluation throughout its duration. This includes approvals for human subjects research, such as informed consent and disaggregation of identifiable information. Not having the appropriate data collection permits could delay or cancel the work planned for the evaluation.



Task 1.5: Carry out a stakeholder analysis

Different stakeholders in the fisheries co-management system are identified to ensure that they are informed about the evaluation and can participate in it. This identification is undertaken using a stakeholder analysis. A stakeholder is an individual, group or organization that influences or is otherwise interested, involved or affected by a particular fisheries co-management system. This can include, for example, fishers, fish buyers, women, youth, elderly, government fisheries managers, boat owners, co-management organizations and others. The stakeholder analysis can identify economic, social and political power structures in the area that may impact upon the evaluation.

Capture fishing is predominantly male-dominated but women are found in different phases of fisheries production, from pre-production (net preparation, boat maintenance, bait and fuel purchase) to post-production (post-harvest processing and trading). By integrating gender aspects into the analysis, fisheries co-management plans can be more inclusive, with more highly targeted results that ensure gender equity and women’s empowerment are achieved within fisheries management systems. Gender analysis has been developed to highlight the specific contributions and concerns of women, men, girls and boys (the youth) in order to better understand gender relations in fisheries co-management. Improved understanding of the gendered division of labour in fisheries co-management will also reveal the unique contributions of men and women and thereby identify more specific actions or interventions to address gender inequities in the fisheries co-management system (USAID Oceans, 2019).

Box 3. What is a stakeholder analysis?

Stakeholder analysis is a tool for identifying the needs and concerns of different stakeholders.

The purpose of a stakeholder analysis in co-management is to identify who the key stakeholders are, and then determine how their interests should be addressed in the co-management system and plan. These different stakeholders all have their own demands and interests, and determining how those different interests will be balanced is a key part of stakeholder analysis. Stakeholder analysis can be a useful tool for: gaining understanding and building consensus; communicating the benefits of a proposed project; and building strong, inclusive campaigns that involve the public.

Source: FAO. 2008. *Stakeholder analysis*. Food security information for action. Practical guides. Rome.

Task 1.6: Plan for stakeholder participation



Evaluations should be participatory at all stages of design, data collection and analysis. Involving resource users/rights holders and stakeholders in the evaluation is crucial because they may be interested in questions that differ from fisheries co-management leaders or government, they are likely to be directly affected by any actions that the evaluation results may lead to, and they have information that no one else might have. At a minimum, the co-managers, representing user groups, the fishing community and government of the fisheries co-management system, should be involved in the evaluation, as well as women, youth and Indigenous Peoples. It may be necessary to build the capacity of stakeholders to participate in the evaluation and resources will need to be allocated to develop this capacity.

While key stakeholders should be appropriately involved throughout the evaluation process, a specific activity on validation of the preliminary results of the evaluation needs to be planned for. This validation process could also involve an external review in addition to an internal one by primary stakeholders. This is further discussed in Task 5 under Step 3 below.

Task 1.7: Determine the audience(s) who will receive the evaluation results and develop a communication plan



Before the evaluation begins, determine the audience(s) that is/are to be reached and develop a plan for communicating and reporting the results. There may be a number of different audiences who will require different methods of communicating results.

For example, the primary audience may be whoever requested the evaluation, such as a national agency, co-management leader, or donor. Keep in mind that there may be others that would find the results useful and that they could bring benefits to the co-management efforts. Special attention should be given to ensuring that primary stakeholders and resource users and others whose livelihoods depends on the co-management resources are reached. This may require communication products and means in local languages and based around illustrations rather than text.

Using the results of the stakeholder analysis carried out in Task 3 will help to identify the target audience(s) and how to communicate with them. Answering the following questions may also help:

- For each audience – what do you know about their preferred method of receiving information? This may be closely related to their technical capacity. For example, do they prefer to read information or listen to a radio or television? Are they computer literate and do they use the internet regularly? Do they gather together periodically at meetings or conferences? If so, when are these meetings scheduled?
- What language does each audience speak? What is their average educational level? What style of communications do they prefer – technical and academic or casual and conversational? Where and how are oral communications typically conducted?
- What, specifically, do you expect each audience to do with the results and information you present to them? What actions do you want them to take following the delivery of your results? How are these expectations linked to the goals and objectives of the co-management system?

Prioritize primary audiences based on the need to reach them, and how they will use the results, and the types of actions they can take, and develop a communication plan including specific considerations for each of the audience groups.

A communication plan will contain the following elements:

- An *audience analysis matrix* that identifies the range of possible internal and external audiences, their characteristics, and a set of *priority target audiences*.
- A description of how target audiences prefer to receive information will help in developing a logical presentation and format (one-way and/or two-way communication) for sharing the evaluation results with the target audiences. Use a diversity of communication methods. The communication method may range from a summary report to a donor, to a video for resource users.
- A strategy for how and where results will be delivered by identifying which *one-way and two-way presentation formats* will be used with each or groups of target audiences, and the *approach and style of delivery* to be taken. A results delivery strategy outlines exactly how to conduct the presentation formats identified and assigned to target audiences. Consider how to make the presentation formats most meaningful and thought provoking for the target audiences and include this in the results delivery strategy. For example, what language, tone, style of text, and voice (i.e. passive or active) will most resonate with the target audience? The results delivery strategy should include which messages and what formats will be used to communicate with different target audiences. Use the audience analysis matrix to identify outreach opportunities.
- A set of *key messages* with illustrative examples and stories that explain the results and that help to focus the attention of particular target audiences. Messaging allows the evaluation team and co-managers to keep in mind the critical pieces of information that target audiences will be looking for during the evaluation and as results are generated.

- A *timeline* of when messages and presentation formats are to be released and delivered to target audiences. Develop a timeline of when to release or deliver these messages using the various presentation formats. This timeline will depend on the type of formats and style in which results are delivered.

The communication and presentation methods identified will also be useful for the validation process. A validation of the preliminary results of the evaluation should be carried out before final conclusions and recommendations are agreed on and also in this process the appropriate way of communicating will need to be thought through (see Task 3.5 below).



Task 1.8: Identify key criteria for the evaluation of the fisheries co-management system

As discussed in Section 2.2 above, there are a number of good practices that have been identified over the years with co-management experience. These should be used as benchmarks for the evaluation of the co-management system design and performance.



Task 1.9: Locate the fisheries co-management plan

If there is a fisheries co-management plan, it will contain goals and objectives. These can be more or less detailed and cover environmental, social, economic and governance aspects. The clarity of the goals and objectives should be assessed and also how they were agreed on (who prepared the plan, when it was prepared and what the level of stakeholder participation was). If no plan with goals and objectives is available, or if they are not clear, not formalized or appear not to have been agreed on through an appropriate process, the focus of the evaluation should be on the good practices of the co-management system. It is strongly recommended that goals and objectives through a co-management plan be developed in a participatory manner with fisheries co-management stakeholders so that their degree of achievement can be assessed, but this is likely to have to be a separate undertaking from the evaluation itself.



Task 1.10: Select the indicators

This Guidebook offers a variety of recommended indicators that reflect a diversity of fisheries co-management system good practices and fisheries co-management plan goals and objectives. As stated above, the fisheries co-management effectiveness evaluation is being undertaken in two complementary parts. One part is the evaluation of the co-management system itself, i.e. how well the fisheries co-management system was developed and how well it functions against good practices of co-management. The other part is the evaluation of the achievement of goals and objectives as stated in the fisheries co-management plan. Both of these parts require a set of indicators.

As each fisheries co-management system and plan is unique, indicators presented in this Guidebook are not necessarily universally appropriate to all fisheries co-management systems and plans. This is particularly true for the co-management plan part of the

evaluation – only those aspects covered by goals and objectives in the co-management plan can be evaluated (e.g. if there are no economic goals and objective, there is no need for economic indicators). If the co-management plan includes a monitoring and evaluation system with already identified indicators and targets, these should form the basis of the evaluation.

For the design and functioning of the co-management system itself, it is however important to use indicators that cover all good practices. When defining the purpose and scope of the evaluation, the specific questions that need answering have been identified in Task 1.1 and these will also guide the indicators that are needed.

It is also necessary to be realistic with regard to the budget and resources available to the evaluation as each indicator will require data to be collected and measured. Users of this Guidebook are also encouraged to develop their own indicators which best meet the needs of their fisheries co-management system and plan. However, selecting indicators that are appropriate should be a participatory process involving the resource users and other key stakeholders.

Box 4. What are good indicators?

An indicator is a unit of information measured, usually over time, that will allow a determination of whether or not ambitions, goals and objectives are being achieved. Because “effectiveness” is a multi-dimensional concept, a range of different indicators should be used to determine how the fisheries co-management system is doing. Alone, they are not sufficient proof.

Following good practices, a good indicator meets five criteria (Margolius and Salafsky, 1998):

- **Measurable:** able to be recorded and analysed in quantitative or qualitative terms;
- **Precise:** defined the same way by all people;
- **Consistent:** not changing over time so that it always measures the same thing;
- **Sensitive:** changing proportionately in response to actual changes in the attribute or item being measured;
- **Simple:** simple indicators are generally preferred to complex ones; and
- **Affordable:** less costly indicators to collect and analyse data are generally preferred to costly ones.

For example, if the objective is: by the end of the second year no fishers will be using cyanide or bombs to capture fish, an indicator could be: numbers of incidents of fishers using cyanide or bombs.

This indicator is difficult to measure because fishers may use cyanide or bombs secretly and it would be impossible to measure.

A better indicator to use would be: reef area damaged by bomb fishing.

Source: adapted from Margolius, R.A. & Salafsky, N. 1998. *Measures of success: designing, managing, and monitoring conservation and development projects.* Washington, DC, Island Press.

The following activities can be followed in selecting the indicators:

- **For evaluating the fisheries co-management system**, indicators are selected based on the good practices and co-management process in sections 2.2 and 2.3 above. All good practices should be evaluated. The good practices/process identified above have associated indicators (Annex 1) that need to be used for the evaluation of the fisheries co-management system implementation process. There is generally one indicator for each best practice.
- **For evaluating the fisheries co-management plan**, the indicators are selected by first identifying the goals and objectives of the fisheries co-management system in the co-management plan. There may be many goals and objectives in the plan and they may be grouped as social, economic, ecological and governance to more easily select indicators. Then, identify the indicators in the assessment sheet in Annex 2 that match the goals and objectives of the fisheries co-management plan. If no appropriate indicators are included in the assessment sheet, users are encouraged to develop new indicators that best match the goals and objectives of the fisheries co-management plan. List all the relevant goals and objectives and associated indicators. If the co-management plan includes a monitoring and evaluation system with already identified indicators and targets, these should form the basis of the evaluation.
- Review and prioritize the indicators identified by determining the feasibility of measuring the indicators identified (see Task 1.10 below). Determine if baseline data or data for different years exists for the indicator to be able to analyse trends. If it is not feasible to measure all indicators based on time and resources, prioritize them. Complete the list of selected indicators.
- This selection process should not become more complex than necessary. The indicators for the evaluation of good practices have already been identified. It should be fairly intuitive to identify the appropriate indicators for the evaluation of the fisheries co-management plan based on the goals and objectives.

Annex 1 gives more details with regard to practical indicators for evaluating the fisheries co-management system and Annex 2 discusses social, economic, ecological and governance goals and objectives and indicators for measuring the achievements of the fisheries co-management plan.



Task 1.11: Assess what methods and resources are needed for carrying out the evaluation

In completing the selection of a set of appropriate indicators, there is now a need to estimate the resources required to measure the indicators.

- Determine the methods and types of analysis needed to measure the selected indicators. For example:
 - What methods will be used to collect data such as observations, surveys and semi-structured interviews?⁵ Pilot test the methods.
 - What sampling approach will be used? For example, how many people will be interviewed, how many questionnaires deployed, what share of the catch looked at?

⁵ Some examples of possible data collection approaches for the different indicators are given in Annex 1 and Annex 2.

Box 5. Sampling approach

Well-defined sampling will ensure that the data collected are accurate and robust. It can provide the team with greater interpretive power and a higher degree of confidence for decision-making. First, the evaluation team should decide on the sampling units for collecting different types of data. For example, the sampling unit for a social or economic indicator could be an individual, a household or a stakeholder group. Knowing which sampling units are required will help to determine the best approach to data collection. The following should be considered when developing a sampling approach:

- Define the sampling site(s). This should include a spatial definition of the management unit that is being evaluated;
- Choose the type of sampling, for example, non-random sampling or random sampling;
- Characteristics of the fisheries system (i.e. types of fishing activity and gears, time of fishing, seasonality of fishing, location of households); and
- Adequate representation from segments of society (i.e. collecting gender-disaggregated data, representation of vulnerable or marginalized groups).

Source: Authors' own elaboration.

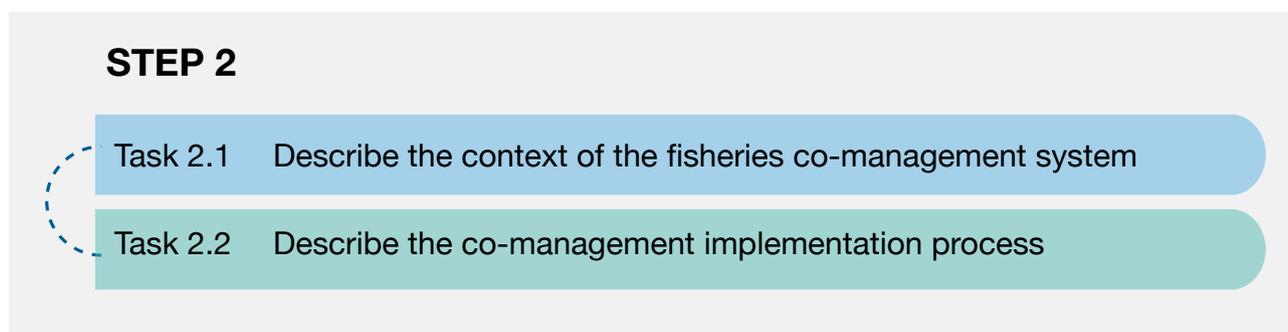
- How are the information and data collected going to be recorded? Is there a need for a proper database, or are Excel sheets or paper records going to be used?
- What methods will be used to analyse the data? Are there preparations needed in this respect?
- Determine the estimated human resources needed to measure and analyse the selected indicators. For example:
 - How many people will be required to collect data for each indicator?
 - What level of participation is wanted?
 - How long will it take to complete the evaluation? How much time is needed for each indicator?
 - What level of skills and training is necessary?
 - Do the members of the evaluation team have these skills and training?
 - Will outside technical assistance be required?
 - Which indicators, if any, have similar data collection methods and can be measured concurrently?
 - What is the motivation for people to participate in the data collection?
- What other resources and equipment are needed?
- What types of infrastructure (such as electricity to run computers) are needed onsite where the evaluation team will be working?
- What equipment (such as SCUBA gear or hand-held global positioning system units) and transportation (such as boats, a truck, fuel) are required to measure the indicators?
- What types of analytical tools (such as database and statistical software programmes, or geographic information system [GIS] equipment) are needed to generate and analyse results?

4.2.2 Step 2: Compilation of information

The step involves a description of (1) the context of the fisheries co-management system and (2) the process of implementation of the fisheries co-management system (Figure 10). It is meant to provide background information on the fisheries co-management system to support the evaluation process and help the evaluation team in measuring the indicators and in the interpretation of the results. The descriptions of context and process can be as detailed as the evaluation team feels is required and as time and resources allow. However, neither description needs to be very detailed on every step in the implementation process, or all of the attributes of the resource, resource users and institutional and organizational arrangements. There is no need to collect data that is not needed for the evaluation. It is meant to provide the evaluation team with a general overview of the fisheries co-management system context and process so that everyone has a better and equal understanding of the system. It is expected that much of the data used for these two descriptions can be obtained by the evaluation team from secondary data sources or interviews of key informants. For example, a description/profile of the area being co-managed should have been prepared when establishing the fisheries co-management system and should be included as part of the fisheries co-management plan. This profile may only need to be updated. Similarly, leaders of the fisheries co-management system can serve as key informants as some may have been involved with the system since its inception and have a good historical recall of what was done, why and by whom. The results of the two descriptions are presented in a report with narrative, tables and figures.

The evaluation team should collect all relevant secondary data to be used for the description of the context of the fisheries co-management system (Task 1) and the process of fisheries co-management implementation (Task 2). Secondary data are those that have already been collected, analysed and published in various forms from government agencies, universities, non-governmental organizations, private sector and research institutions. Both of these tasks can rely primarily on secondary data to save money and time, unless any updated data and information is needed for either description.

Figure 10. Tasks of Step 2



Source: Authors' own elaboration.



Task 2.1: Describe the context of the fisheries co-management system

This task will describe the context of the fisheries co-management system under evaluation by characterizing key attributes of the resource system (biological, physical and technical); the resource users (fish harvesting, fish marketing, social, cultural, economic, political and power structures); governance (institutional and organizational arrangements at the community level, external institutional and organizational arrangements); and exogenous attributes (macroeconomic, social, political and natural). These attributes form the context within which resource users, government and other stakeholders coordinate and cooperate to establish and operate the fisheries co-management system to govern, manage and use the resources. See Annex 4 for the list of attributes.

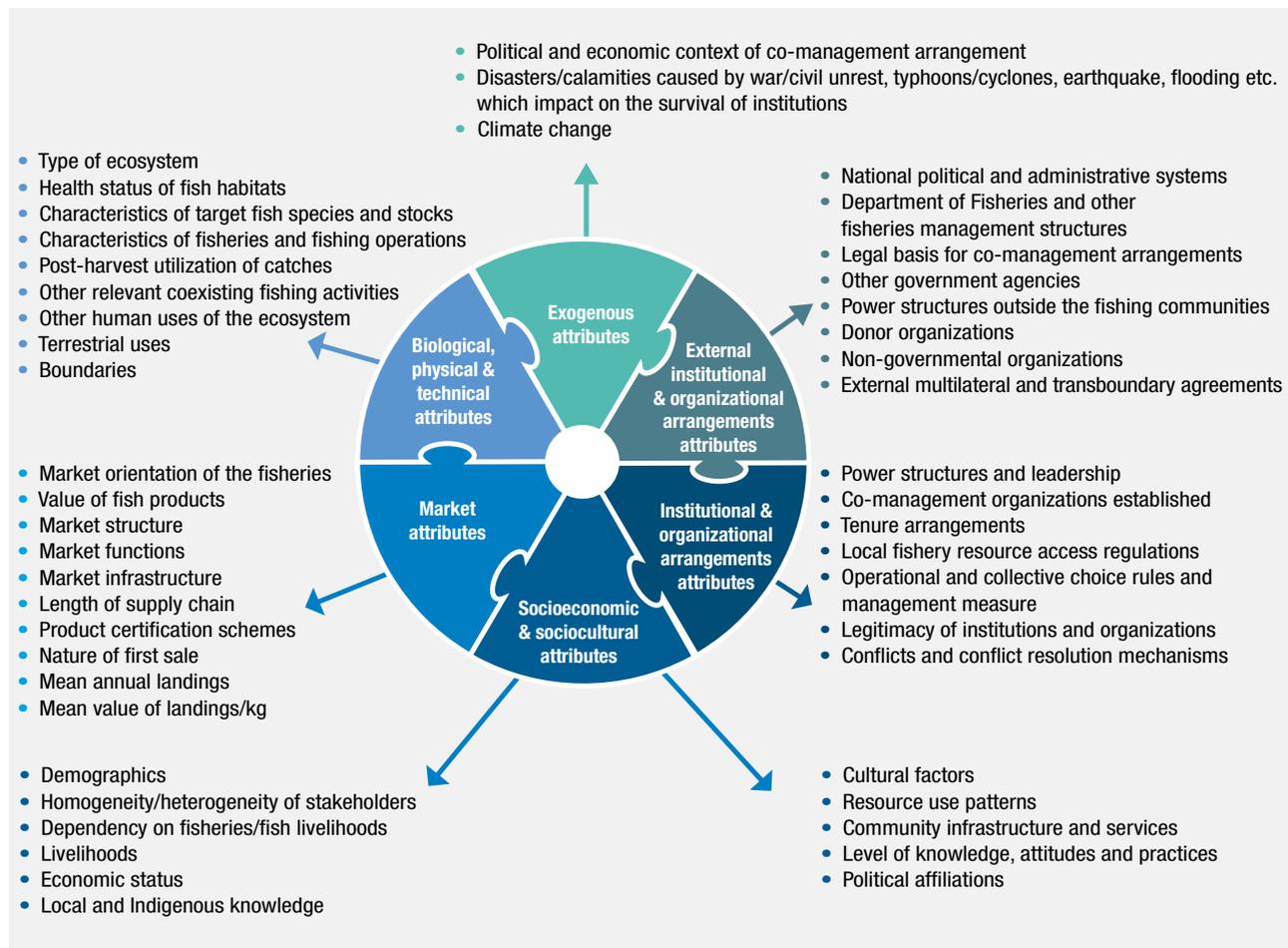
This description of context will be used for the analysis in understanding linkages and relationships between and among the elements of the fisheries co-management system – context, process and patterns of interaction – and outcomes. Each element of the co-management system has a causal relationship with other parts, some stronger and some weaker, depending upon the relationship. Different combinations of these elements can be examined depending upon the situation. For example, the level of heterogeneity of the resource users can have an impact upon their willingness to engage in collective action.

Some of the attributes are also of direct relevance to the evaluation of the co-management itself and may overlap with some of the indicators used to assess whether the system is designed and functions according to good practices.

In Figure 11, key attributes to include in a context analysis are listed (Pido *et al.*, 1996). These examples of the grouping of attributes are meant to provide guidance on the types of information that can be collected in preparing the contextual description of the fisheries co-management system. Please note: *Not all of the information listed for each attribute below needs to be collected. This listing is meant as guidance on the types of information that could be collected for each attribute.* Since co-management is a governance process, a focus should be put on column 4, Institutional and organizational arrangement attributes and column 5, External institutional and organizational arrangement attributes. Institutional arrangements concern the power structures, decision-making arrangements, participation of fishers and stakeholders, legitimacy, mechanisms for rights and rules. Organizational arrangements concern the characteristics of the fora in which decisions are made and collective action such as representation, decision-making procedures, implementation of decisions in the field, and coordination and collaboration with other groups.

External institutional and organizational arrangements occur at higher levels than the fishery/community level (such as national government) and often affect the institutional and organizational arrangements at the fishery/community level. For the attributes it may be useful to describe any major changes in recent years.

Figure 11. Examples of co-management context attributes



Source: Authors' own elaboration.

Task 2.2: Describe the co-management implementation process

This task involves describing the process and activities taken in the development and implementation of the fisheries co-management system. It answers the question “how did we go about it?”. As described in Section 2.3 above, a generic model or process of the implementation of fisheries co-management can be viewed as having three phases: (1) “beginning” or pre-implementation, (2) implementation, and (3) post-implementation or fisheries co-management system sustainability. Within each of the three phases there are a number of activities that can be undertaken. The identification and description of the various activities of the fisheries co-management implementation process allow for an understanding of which activities functioned well or not.

The list of activities in Section 2.3 and in Figure 4 are meant to help identify the types of activities that may be undertaken during the three phases of fisheries co-management implementation. The list is not meant to be inclusive as other additional activities may have been undertaken and should be added to the description. For the fisheries co-

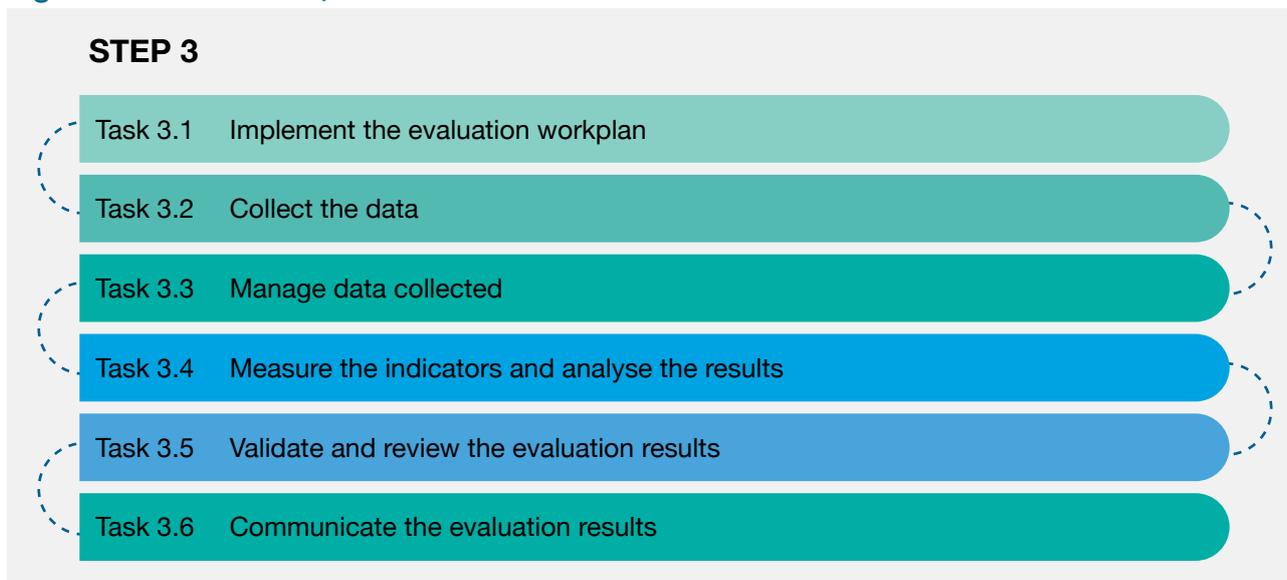
management system under evaluation, the activities of the three phases of co-management implementation (pre-implementation, implementation and post-implementation) should be identified and briefly described in terms of when the activity was undertaken, who led it and what was done.

As with the description of the context of the fisheries co-management system in Task 2.1, the description of the fisheries co-management system implementation process activities is closely linked to the good practices (Section 2.2) and will be used for the analysis of good practices. The description of the process activities will also be used in understanding linkages and relationships between and among the elements of the fisheries co-management system – context, process and patterns of interaction – and outcomes.

4.2.3 Step 3: Evaluation

This step describes how to carry out the evaluation, including collecting, managing and analysing the data that are required for conducting the evaluation (Figure 12).

Figure 12. Tasks of Step 3



Source: Authors' own elaboration.



Task 3.1. Implement the evaluation workplan

The workplan is put into action and the evaluation begins. Doing this requires much more than just collecting data; it also includes careful consideration as to the timing, logistics and process of data collection, management and analysis.

In implementing the evaluation workplan, the evaluation team must continually consider and be ready to respond to the following questions:

- Are there timing restrictions? The evaluation team needs to remain flexible on the timing of its work with respect to unpredictable events that may arise, such as hurricanes,

poor water conditions, sudden community emergencies or cancelled flights.

- Are there new or changing logistical needs? Anticipate and ensure that the necessary logistical arrangements are made and overseen for the evaluation team throughout the implementation of the evaluation. Such arrangements not only relate to fieldwork and data collection, but also to daily needs such as local travel, lodging and meals, access to telephone and e-mail communications, and computer terminals.
- Have the resources been made available? Throughout the implementation of the evaluation, the team will need access to the necessary finances and equipment to do data collection. For example, ecological indicators may require regular access to boats, crew, sampling equipment and fuel. Having safety equipment and finances available for possible medical assistance is also essential. Having someone regularly monitoring that resources are available will allow the evaluation team to focus on the work at hand.
- Is data collected ready to be received? Even though in most cases the evaluation will use relatively simple data collection, management and analysis methods, make sure that systems are in place and have been adequately tested and refined.



Task 3.2. Collect the data

The following activities are needed to collect the data needed for measuring the indicators:

- **For evaluating the fisheries co-management system**, all of the good practices indicators (see Annex 1) should preferably be measured. The data collection for each good practices indicator may involve different methods such as interviews, questionnaire perception surveys, focus group discussions or reading co-management system reports. The information collected under Step 2 on the co-management context and process will also be useful.
- **For evaluating the fisheries co-management plan, as there will be a variety of different indicators** used for the evaluation, it is not possible to provide detailed guidance on the method of data collection for measuring each indicator in this Guidebook (although some suggestions of possible approaches are included in Annex 2). Most evaluations will draw on data that has already been collected over time through various forms of monitoring. It should be noted that data may already be available from baseline surveys conducted in support of monitoring and evaluation, routine monitoring of the co-management process, and from secondary data sources (such as secondary data collected in Step 2 on the co-management context and process). Data collected are used to answer the specific questions, as expressed through the selected indicators, relevant to the evaluation. It is critical that these data are collected accurately.

The different data collection methods, such as a questionnaire or a check list for a semi-structured interview with a focus group, should be pre-tested before being fully utilized. Being trained in, familiar with, and having tested the data collection methods will increase the likelihood that the selected indicators will be measured correctly and consistently. This will help to provide the co-management team with an accurate and comparable dataset to work with, analyse and refer back to through time. Keep in mind that by building internal capacity to conduct the evaluation it will be easier to repeat the evaluation process in the future.



Task 3.3. Manage data and information collected

When data and information have been collected, there is a need to organize and store the data. Data here includes information that is not fully processed to the point of being disseminated as an output, such as images and maps. This process is commonly referred to as data management. This is a critical, and often overlooked, stage of the data collection and analysis process. Data security and confidentiality is critical for data management. Depending on the scope and extent of the evaluation, data management can take different proportions. In some cases, recording data in a simple Excel or similar application and keeping paper records may be sufficient. In other instances, a more elaborate data recording and management system may be required with the appointment of a data manager, and considering the following:

- Determine how collected data will be submitted to the data manager. This will provide a clear and common understanding for both the person submitting data (data collector) and the person receiving the data (data manager) to know what type and in what form the data will be submitted. This will greatly improve the accuracy and efficiency of the evaluation. Metadata recording (e.g. date, time, location, data collector name and traceability information) is also critical to the value of the data for any further processing and interpretation.
- Code the data. Data coding is the process of translating each datum point to prepare for analysis. This translation requires a code sheet where the meanings of data collected and their codes are available to the data manager. Identify a member of the evaluation team who will code the data.
- Develop a system for storing and entering the data. As each datum point is coded, it should also be entered. Data entry is the (often lengthy and tedious) process of moving coded data into a permanent storage location from which to export the data so that it can be analysed. This permanent storage location is known as a database.
- Collate and review the data set. Once data are entered, the data manager is responsible for the collected data and for managing that data. The data manager collates and reviews the data set in order to check for completeness and errors (accuracy) – this is known as data cleaning. If errors (accuracy) or “gaps” (missing datum points) are found in the data set, the data manager should work with the data collector to correct or understand the problem. In some cases, an incomplete data set will reflect an inability to collect a particular datum point and cannot be filled in afterwards.
- Make the data available for analysis and sharing. The aim of data management is to make retrieving data simple and reliable. Coded and stored data are only as good as the ease with which they can be used for analysis and communication. Develop a process for someone to contact and request access to data or receive stored information from the data manager and database. Include who is and is not allowed access to the database, and what the responsibilities are of the people who have access.
- If data collected are found to be in error, they should not be used. Identify and address any source of error before continuing the analysis. Common sources of error include both human and sampling error.



Task 3.4. Measure the indicators and analyse the results

Analysis is the process of carefully considering, comparing and contrasting information with the intention of helping to clarify uncertainty or elucidate answers and insight to specific questions being asked. In the case of this Guidebook, analysis of data collected during the co-management system evaluation will help you to address and respond to the questions about the weaknesses of the co-management system. Analysis should be a participatory process involving the evaluation team and stakeholders to obtain different perspectives on the results. There are two stages of the analysis that will be made:

- Measuring the indicators selected/developed in Task 1.9, i.e. putting a value on each selected indicator; and
- Analysing the results and interpreting the values of the measured indicators.

To **measure the indicators**, the relevant information needs to be gathered for each indicator. This may include data from the database, written notes from evaluation team members, or other sources depending on the data management system in place (see previous section). Depending on the complexity of the evaluation and the data collection, measuring indicators can be done in different ways. The most appropriate way of analysing the data should be determined, whether quantitative or qualitative. For example, it may only involve a simple calculation such as sums and percentages. Or, if data are collected from a statistically representative sample, it may require more advanced descriptive statistics, such as the standard deviation, means and modes, and paired t-tests. Qualitative data analysis involves explanation, understanding or interpretation of people and situation investigated. A number of different types of qualitative analysis can be used, including content analysis, narrative analysis, discourse analysis and framework analysis.

As a relatively simple way of measuring the selected indicators, this Guidebook proposes assessment sheets where each indicator is formulated so that it can be scored on a scale of three.

- For **measuring the indicators for the fisheries co-management system** good practices, the evaluation assessment sheet included in Annex 1 can be used. A three-level scoring of the level of completion of each indicator is undertaken: the best practice exists, exists partly or does not exist.
- For **measuring the fisheries co-management plan indicators**, an evaluation assessment sheet in Annex 2 is used to analyse the achievement of the co-management plan's goals and objectives and associated indicator(s). A three level (fully achieved, partly achieved and not achieved) scoring of the level of completion of each goal and objective (and associated indicator[s]) is undertaken.

Comment boxes are provided on the assessment sheets to include additional explanations of the level of completion or achievement score as needed. Boxes for noting the method/source of information are also provided for describing the method and/or source of information used to measure the indicator.

Once the indicators have been measured, these **results should be analysed**. For the results to be useful and to allow for corrective action to be taken as needed (see the section below on Post-evaluation and adaptive management), it is important to understand the reasons behind a score.

As explained in Section 3, the analytical framework will serve to help organize the analysis by providing a common analytical structure that will enable data to be analysed in a systematic way and allow generalizations and comparisons to be made. The analysis involves interpreting the values of the indicators, understanding linkages and relationships between and among the elements of the fisheries co-management system – context and process – and evaluation results. It can also help to look at trends and implications, including over time if the data available allows for this. Rather than seeking to prove “cause and effect” relationships, the analysis focuses on the “explanatory power” or understanding the “why” the result has occurred of all the elements in the co-management system and considering how the results can be best explained.

The results of the co-management system evaluation will be used for the analysis of the co-management plan because there is a causal relationship between the level of completion of the good practices and the resulting achievements of goals and objectives of the co-management plan. For example, the lack of achievement of an objective may be found to be related to lack of completion of a best practice.

It is also important to look at relationships between different indicators. These relationships are crucial because just looking at an individual indicator without understanding their interaction can lead to a misleading evaluation. For example, social factors, such as whether traditional knowledge is integrated in fisheries co-management plans, may influence if management measures are appropriate and operational. Likewise, the existence of fairly allocated tenure rights may influence if resource users perceive that there are incentives to participate in the co-management arrangement.

The analysis will involve explaining the results of the scores for the indicators and in turn why good practices either exist, only exist partly or do not apply, and why the co-management plan objectives have been achieved or not. This type of analysis should focus on the main purpose of the evaluation and a review of the questions being asked by the evaluation. What are the essential questions that whoever commissioned the evaluation wants to address or fully answer?

Depending on the indicator, there may be different views on what the reasons behind a score are. The analysis should be a participatory process involving the evaluation team and stakeholders to obtain different perspectives on the results. It is helpful to draw these relationships on paper in a diagram.

Box 6. Example of analysis

An example of the analysis of an evaluation of a fisheries co-management system and plan utilizing the analytical framework is:

- An objective of the fisheries co-management system may be: *effective stakeholder participation and representation*.
- An indicator to evaluate achievement of this objective may be: *all main stakeholders are empowered and capable to actively participate in decision-making, including women and youth*.
- The results of the evaluation found that the outcome of the objective was not achieved and that there were only a limited number of stakeholders participating in relevant meetings and making their voices heard.
- The framework provides a structure for the analysis of why the objective was not achieved by looking at the relationships between this result and the context of the system (Task 2.1), the process (Task 2.2) and other related indicators.
- In this case, it was found that a possible explanation for there being only a few participants at meetings could be: (1) the resource users were heterogeneous from many different ethnic groups (context); (2) meetings were not organized on a regular basis (process); (3) that the process of implementing the co-management system did not involve enough capacity-building on working together and building trust (best practice indicator).
- The “explanation” for this poor outcome was that there was a limited incentive for the resource users/co-management participants to meet as they did not trust each other.
- An adaptive management strategy was agreed to have more training on building trust and to schedule monthly meetings between managers and resource users so that there could be more direct interaction and discussion.

Source: Authors' own elaboration.



Task 3.5: Validate and review the evaluation results

It is recommended to validate the draft results with stakeholders (identified in Step 1, Tasks 3, 4 and 5) through meetings and focus group discussions. This will allow stakeholders (including women and men, youth, Indigenous Peoples and vulnerable and marginalized groups) to review the results before they are more widely disseminated and to provide critical feedback on the analytical findings. Stakeholders are asked to carefully review the evaluation methods, results and findings, and to provide critical and constructive criticism as to how to address any shortcomings, as well as agree with or reject the interpretation and conclusions of the results. In some cases, the feedback may require the evaluation team to discard or reconsider certain results or findings and/or go back and re-plan and remeasure certain indicators.

Once an internal review is done, distribute a revised evaluation report for an external review. Select respected and trustworthy experts from both the technical (scientific and policy research) and target audience ends. Invite them to review and comment on the revised evaluation report within an adequate period of time. In some cases, reviewers will be unable to undertake a review, so prepare a secondary list of reviewers at the outset. It is also important to keep in mind that this external review process may take a bit longer than the internal review. Once comments are received, have the evaluation team and those who commissioned the evaluation review them and incorporate changes to the report as appropriate. The end result of a successfully completed internal and external review process is typically an improved product with greater legitimacy, transparency and credibility. This will enable the provision of a well-grounded report for target audiences.



Task 3.6: Communicate the evaluation results

This task includes sharing the results and discussing them with the identified target audiences and identifying ways to adapt management practices to improve fisheries co-management. Messaging allows the evaluation team to identify the critical pieces of information that target audiences will be looking for resulting from the evaluation. A set of key messages will explain the results and help to focus the attention of particular target audiences. When preparing results and conclusions for sharing, determine how to orally and visually present them to different audiences, and how to distribute written reports (including graphs and tables of results) in accordance with the communication plan developed in Step 1. Include stories or anecdotes from stakeholders or the evaluation team that help to illustrate the results. The budget developed in Step 1 will provide resources for communicating the results.

5 Post-evaluation and adaptive management



5. POST-EVALUATION AND ADAPTIVE MANAGEMENT

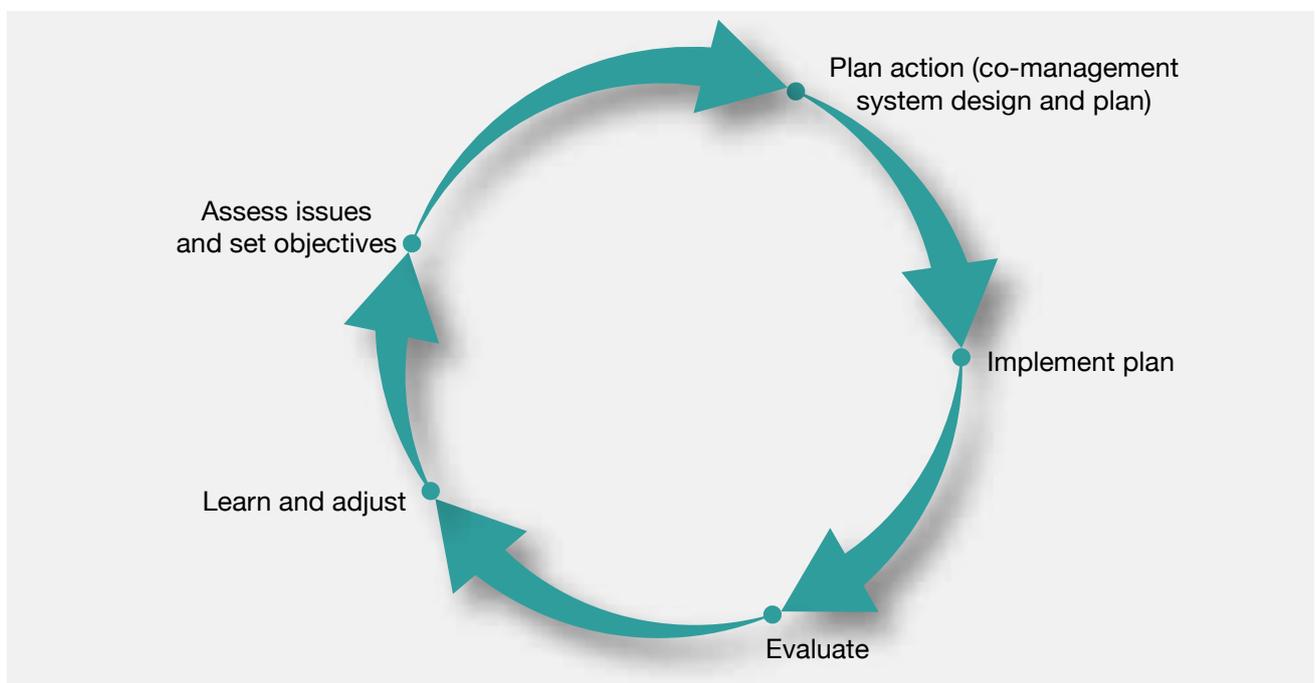
The results of the evaluation provide a better understanding of why the co-management system may not have had the intended impact and why goals and objectives have or have not been achieved, and whether the design and performance of the fisheries co-management system is appropriate. The results will also improve knowledge of fisheries co-management more generally. Based on the improved understanding and knowledge, strategies and actions for correcting underperformance and improving implementation can be identified.

Adaptive management can be defined as a formal process of systematically testing management assumptions through time, learning periodically from the evaluation of such testing and using this learning to revise and improve management practices. In other words, adaptive management is the process of testing formal and informal assumptions in order to learn and adapt future action. It is test–learn–adapt or “learning by doing”. The idea is that by asking specific questions, you learn and get results to help make informed decisions and adapt your actions, which can lead to improved performance. This process of asking questions, collecting information to answer them, learning from the results, and adapting behaviour and practices is a cyclical one that in theory should allow a person or group to increasingly hone in on and refine their abilities and impact with each subsequent revolution through the adaptive management cycle. This creates a positive feedback loop that continually improves on itself as it moves closer to its ultimate goal and sustains itself there. The principle of adaptive management is widely accepted and frequently cited, not only within natural resource management and environmental conservation, but also within business, health and human services, public service, and development.

Adaptive management is at the core of fisheries co-management. Adaptive management is an on-going, routine, real time activity of a fisheries co-management system undertaken by the co-managers and stakeholders daily to fine-tune management and react to unexpected new situations or externalities that become evident in regular monitoring (Figure 13). Learning by doing actual adjustments to the co-management system should happen continuously as information and data on fisheries co-management is developed and shared. However, too frequent adjustments can be unsettling and slow the process of institutionalizing what is working. This can be considered to be a lower-level operational adaptive management, based on regular monitoring, as compared to the higher-level adaptive management discussed here resulting from a periodic, more in-depth effectiveness evaluation of the whole fisheries co-management system. Data and information generated by regular monitoring and the lower-level operational adaptive management needs to share with the higher-level evaluation and adaptive management to improve the overall process. Lessons learned through adaptive management need to be written down and stored in an accessible format so that there is social and institutionalized learning and continuity of shared knowledge.

The reason for conducting a management effectiveness evaluation is for co-managers to use the information generated to adapt and improve the co-management system's process, management, planning, accountability and overall impact. Once results are shared with target audiences, such information can be combined with other data sources and decision-making needs to improve co-management processes and underlying contextual issues. Such integration is done in order to enhance the power and relevance of decisions made on future actions and the co-management strategy. How information and learning provided by the evaluation process are used by target audiences to adapt management must also be monitored as part of an iterative evaluation process. Observations on how results are eventually used will help design future evaluations.

Figure 13. Adaptive management cyclical process



Source: Authors' own elaboration.

Adaptive management is essentially about iteration. That is, repeating the process or steps that bring you successively closer to your desired result. Iteration involves using the results of the evaluation to improve the co-management system. It helps management to adapt and improve through a learning process. It is important to build internal capacity for iteration and for continuity of knowledge gained over time from the evaluation process.

As the co-management system is evaluated, it may be found that the design is appropriate, the performance good, and the goals and objectives have been successfully achieved and that no changes are needed. Alternatively, it may be found that things are not going as well as they could and some changes will need to be made to the goals and objectives and/or the way things are done or how the co-management arrangement is structured. Decisions about the changes will need to be made by the co-managers in a participatory manner. Changes to the goals and objectives and actions may need to be made through a meeting of all those involved with the fisheries co-management system to review and revise the management plan and the design and processes of the system itself. Specific changes

to actions can be developed by modifications to the workplan, including who will lead the changes, what will need to be changed, how to make the changes, what resources are needed, and a timeline for making the changes. If there are many changes needed, the changes may need to be prioritized based on the importance of the change and the resources available to make the changes. As co-management is a partnership of resource users/user groups and government, some changes may be taken by the resource users/user group, some changes by government, or some changes jointly. The “who” will be specified in the workplan. It is now the responsibility of the co-management’s leadership to ensure that such adapted management practices are not only implemented, but also maintained over time.

Some things to consider when incorporating evaluation results into ongoing planning and the management decision-making process:

- Complement the evaluation results with other information about the fisheries co-management in the decision-making process.
- Maintain flexibility and be prepared to make changes. If the evaluation reveals that something is not working, find mechanisms to make changes.
- There will be costs involved in adapting and making changes. Some costs may be too high to make the changes immediately. Find mechanisms to make smaller changes which may be less costly but can be conducted incrementally to make the larger change needed to the fisheries co-management system.
- Be willing to learn from both success and failure, as it will help to strengthen the co-management system.
- Use common sense, past experience, and the information that is available to make decisions.
- Use tools for negotiating, reaching agreements, and securing commitments to take actions when deciding to make changes based on evaluation results.
- Determine the best way to make changes in a participatory manner, such as holding workshops with different stakeholder groups.

Results are always useful. However, there may be cases in which the results that have been obtained from the evaluation are highly problematic. What can be done? There are several courses of action:

- Check the data collected and the methods used to ensure that they make sense. Were the correct methods used and used in the correct way for each indicator? Was the data entered correctly? Were the right people interviewed?
- Review the indicators that were selected to ensure that they match the most important goals and objectives and revise them as needed.
- Return to the evaluation plan and revise it according to adjusted and/or new data collection needs. Make sure that the resources are available to collect this data.
- Resume data collection using a revised set of indicators and a revised evaluation plan.
- Have frequent, if not continuous, exchange and discussion with local stakeholders to rectify mistakes/misunderstandings, adjust collection method, select the right key informants, etc.

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Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

The assessment of a fisheries co-management system focuses on the standard of management within a system, or the appropriateness of the co-management system and process. That is, an assessment of the way in which the co-management system is designed, implemented and performs. Are the good practices and standards of fisheries co-management in place and being followed? What is the suitability of co-management practices and processes and the extent to which established or accepted co-management practices are being implemented?

As presented in Section 2.2 above, a number of success factors and good practices for fisheries co-management have been identified.⁶ These good practices can be seen as a recipe for successful co-management that creates benefits and contributes to sustainable development and good governance. They can be categorized according to whether they refer to the external enabling environment, the internal attributes of the co-management system itself and to the individual co-management participants. They also relate closely to principles underpinning the VGGT and the SSF Guidelines mentioned above, and also to general good governance principles.

As presented in Step 3 above, the assessment sheet is used to collect data, measure and analyse to evaluate the fisheries co-management system.

⁶ See, for example, Pomeroy *et al.* 1997; Pomeroy, Katon and Harkes, 2001; Pomeroy, Cinner and Nielsen, 2011; Evans, Cherrett, and Pemsil, 2011; Gutiérrez, Hilborn and Defeo, 2011; d'Armengol *et al.*, 2018.

Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Name of fisheries co-management system: _____

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.1	ENABLING ENVIRONMENT – EXTERNAL FACTORS							
I.1.1	GOOD PRACTICE: Enabling policies and legislation for fisheries co-management: supportive legislation, policies, rights and authority structures are in place							
I.1.1.1	INDICATOR: The legal framework gives the resource users, and their representatives, an equitable and clear role in developing and implementing a fisheries co-management plan	Review of legislation; questionnaire survey (perception); Interviews and consultations with local institutions						
I.1.1.2	INDICATOR: Number of co-management agreements that have been signed and approved between government and resource users/community	Review of co-management agreement or arrangements agreed by involved parties to constitute co-management						
I.1.2	GOOD PRACTICE: Tenure rights of the co-managed fishery resources: formal and recognized rights to the fishery resources are granted to the co-management unit and defined mechanisms (economic, administrative and collective) and other structures required for allocating use rights among co-management participants are in place							
I.1.2.1	INDICATOR: Tenure and access rights are fairly and equitably allocated in a transparent and accountable manner	Review of government agreement and tenure arrangements; Questionnaire survey (perception) among different resource users along the value chain; Focus group discussion among resource user groups; Consultations with organizations/associations of resource users						
I.1.2.2	INDICATOR: Tenure and access rights have been adequately integrated/reflected in the fisheries co-management agreement	Review of government agreement and tenure arrangements; Questionnaire survey (perception) among different resource users along the value chain; Focus group discussion among resource user groups; Consultations with organizations/associations of resource users						

Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.1.2.3	INDICATOR: All stakeholders have access to information on the tenure rights and resource allocation criteria and processes	Review of existing (legal) documentation and how it can be accessed; Stakeholder consultations; Standardized semi-structured questionnaire as part of key informant survey, supported through focus group discussions						
I.1.3	GOOD PRACTICE: Authority of government on the right to organize and make management rules: resource users have legal right to organize and make rules							
I.1.3.1	INDICATOR: There are legal provisions for resource users to organize and register formal organizations	Review of legislation and procedures for registering an organization						
I.1.3.2	INDICATOR: Co-management responsibilities have been formally delegated to the co-management committee	Review of co-management agreement; Review of the charters of professional fishers' organizations; Review of terms of reference of co-management committee partners, co-management bodies, professional organizations, and executive boards						
I.1.4	GOOD PRACTICE: Support of government and political/economic elites: active cooperation and power sharing with resource users							
I.1.4.1	INDICATOR: The government supports and participates in co-management according to agreement with resource users on cooperation	Review of co-management agreement; Discussions with key informants; Interviews with local authorities (district, communal) delegated to implement co-management; Focus group discussion with co-management partners; Interviews with key informants and stakeholders						
I.1.4.2	INDICATOR: Decision-making is shared across scales and between diverse stakeholders with an interest in the resource being co-managed	Review of co-management membership and protocols for member participation and representation on the co-management committee; Interviews with key informants and stakeholders						

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2	CO-MANAGEMENT SYSTEM – INTERNAL FACTORS							
I.2.A	ACCOUNTABILITY AND TRANSPARENCY							
I.2.A.1	GOOD PRACTICE: Membership and rights clearly defined: individual fishers, households or companies with rights to fish in a bounded fishing area, to participate in management and to be an organization member are clearly defined							
I.2.A.1.1.	INDICATOR: Right to fish, to participate in management and to be a member of related organizations are agreed and clearly stated in co-management documentation	Review of co-management documentation; Interviews with key informants; Consultations with representatives of the professional fisher's organizations on compliance with the rules and regulations by all co-management parties						
I.2.A.2	GOOD PRACTICE: Conflict management mechanisms: existence of a mechanism to address conflict							
I.2.A.2.1	INDICATOR: Conflict management mechanism is in place, functional and documented	Review of co-management documentation; Interviews with key informants; Consultations with representatives of the professional fishers' organizations.						
I.2.A.2.2	INDICATOR: Conflicts between different resource user groups/ stakeholders are resolved in a sustainable manner	Review of incident reports and complaints to police, community leaders or other instances addressing conflicts; Interviews with conflicting parties (if any)						
I.2.A.3	GOOD PRACTICE: Accountability: co-management conducted in an equitable, open and transparent manner							
I.2.A.3.1	INDICATOR: Decision-making by and leadership of the co-management system is transparent and documented in committee meeting minutes available to all co-management participants	Review of co-management committee meeting minutes; Questionnaire survey (perception)						
I.2.A.3.2	INDICATOR: There is a democratically elected management committee representing resource users/user groups	Review of protocols of the election of co-management committee members						

Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.A.4	GOOD PRACTICE: Leadership: existence of a singular individual with entrepreneurial skills, highly motivated, legitimate and respected as a local leader							
I.2.A.4.1	INDICATOR: A qualified local leader with entrepreneurial skills elected by local people to lead overall co-management activities	Review of protocols of the elections of co-management committee members						
I.2.A.4.2	INDICATOR: A qualified local leader is properly working with resource users/user groups for sustainable fisheries and community livelihoods	Questionnaire survey (perception); Focus group discussions; Observation						
I.2.B	FEASIBILITY AND PERFORMANCE							
I.2.B.1	GOOD PRACTICE: Appropriate scale: scale may vary but should be appropriate to the area's ecology, people and level of management							
I.2.B.1.1	INDICATOR: The scale and the area of the co-managed fishery have been agreed through a participatory process with concerned stakeholders	Review of co-management documentation; Questionnaire survey (perception)						
I.2.B.2	GOOD PRACTICE: Clearly defined boundaries of the co-management system: the boundaries of the area to be co-managed are distinct so that the fishers have accurate knowledge of them							
I.2.B.2.1	INDICATOR: Boundaries of the fishery to be co-managed have been demarcated, if a spatially defined area; or otherwise clearly described in co-management agreement	Review of co-management documentation; Observation or photos of markers; Review of documentation relating to demarcation procedure; Existence of (GIS-based) maps officially endorsed by the co-management body and incorporated in the co-management agreement; Consistency of the demarcated co-managed areas for fishing with the zones of exclusion, such as conservation areas, navigation routes, nursery ground, etc.						
I.2.B.3	GOOD PRACTICE: Regular interaction: regular, active and participatory meetings of co-management partners to serve as a forum for discussion, power-sharing and trust building							

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.B.3.1	INDICATOR: Regular, active and participatory meetings of co-management participants are held	Review of co-management meeting minutes; Questionnaire survey (perception); Observation of meetings						
I.2.B.3.2	INDICATOR: There is representation of men and women at meetings and active participation by both men and women	Review of co-management meeting minutes; Questionnaire survey (perception); Observation of meetings						
I.2.B.4	GOOD PRACTICE: Adequate financial resources/budget: existence of a financial sustainability mechanism							
I.2.B.4.1	INDICATOR: Funding is secured for at least one year	Review of accounts and agreements with funder						
I.2.B.4.2	INDICATOR: There is a budget and identified sources of funding	Review of financial records and reports						
I.2.B.5	GOOD PRACTICE: Co-management plan: existence of a co-management plan developed and agreed by resource users/co-management participants through a participatory mechanism							
I.2.B.5.1	INDICATOR: There is a co-management plan and it contains key provisions and clear goals and objectives	Review of co-management plan						
I.2.B.5.2	INDICATOR: The co-management plan has been developed with the adequate participation of different stakeholders	Documentation of co-management plan development process; Perception survey; Interviews with key informants; Stakeholders' focus group discussion						
I.2.B.5.3	INDICATOR: The co-management plan has been translated into the stakeholders' native languages	Review of co-management plan						
I.2.B.5.4	INDICATOR: The co-management plan adequately addresses gender equity needs and reflects diversity of perspectives in community/ society	Review of co-management plan; Interviews with key informants						

Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.B.6	GOOD PRACTICE: Clear goals and objectives from a well-defined set of issues: clarity and simplicity of goals and objectives to steer the direction of co-management							
I.2.B.6.1	INDICATOR: Clear and simple goals/objectives and indicators are defined in the co-management plan	Review of co-management plan; Analysis of the extent to which objectives are SMART (specific, measurable, achievable, realistic and timely)						
I.2.B.7	GOOD PRACTICE: Knowledge of resource: resource is one of which stakeholders have a good knowledge and there is recognition of traditional knowledge							
I.2.B.7.1	INDICATOR: Stakeholders have a good knowledge of resources	Questionnaire survey; Focus group discussions						
I.2.B.7.2	INDICATOR: Traditional knowledge is explicitly taken into account in management decision-making	Review of discussion making documentation; Focus group discussions						
I.2.B.7.3	INDICATOR: Participatory research under development/developed	Review of research to determine if it was done in a participatory manner with stakeholders						
I.2.B.8	GOOD PRACTICE: Monitoring and evaluation: participatory, indicators, targets and baselines							
I.2.B.8.1	INDICATOR: Continuity of monitoring and evaluation are conducted in a participatory way	Questionnaire survey (perception); Reviews of monitoring and evaluation reports and minutes; Interviews with key informants						
I.2.B.8.2	INDICATOR: Indicators, targets and baselines are defined in a monitoring and evaluation plan in the co-management plan	Review of co-management plan						
I.2.B.8.3	INDICATOR: Number of changes/ adaptations made by co-management committee based on analysis and decision-making of available monitoring and evaluation results	Review of minutes of co-management committee						
I.2.B.9	GOOD PRACTICE: Adaptive management: a focus on systematic learning-by-doing							
I.2.B.9.1	INDICATOR: Adjustments to the co-management have taken place based on monitoring and evaluation results	Review of co-management plan and committee meeting minutes; Review of the monitoring and evaluation reports						

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.B.10	GOOD PRACTICE: Mutually beneficial alliances and networks: communication and connectedness among various resource user groups and stakeholders							
I.2.B.10.1	INDICATOR: Networks and alliances among various user groups/ stakeholders are in place and functional	Review of registered organizations and their memberships; Questionnaire survey among stakeholders on their organizational memberships; Focus group discussions among co-management parties/user groups and stakeholders						
I.2.B.10.2	INDICATOR: Experiences and lessons learned are shared among various stakeholder groups	Focus group discussions, questionnaire survey (perception)						
I.2.C	PARTICIPATION AND EQUITY							
I.2.C.1	GOOD PRACTICE: Participation by those affected: most individuals affected by co-management arrangements are included in the group that makes decisions about and can change the arrangements							
I.2.C.1.1	INDICATOR: Stakeholders affected by co-management arrangements and decisions are included in the co-management committee	Review of co-management committee membership in comparison with stakeholder analysis (carried out under Step 1); Focus group discussion with outsiders/excluded stakeholder groups; Review of mechanisms envisioned to broaden the membership into co-management organization						
I.2.C.1.2	INDICATOR: Co-management participants and committee members receive advance information before decision-making	Focus group discussions; Review of communication mechanisms and meeting minutes						
I.2.C.2	GOOD PRACTICE: Group/social cohesion: similar characteristics in terms of kinship, norms, trust, fishing gear type, etc. among the resource users							
I.2.C.2.1	INDICATOR: Co-management participants trust each other	Questionnaire survey (perception); Interviews with key informants						
I.2.C.2.2	INDICATOR: The co-management committee members are representative of the ethnicity, religion, etc. of the resource users/ co-management participants	Review of co-management committee members Review of the election/selection mechanisms; Review of the co-management agreement concerning social inclusion and equitable share of representation						

Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.C.2.3	INDICATOR: Members of the co-management system work well and make decisions together	Review of co-management meeting minutes						
I.2.C.3	GOOD PRACTICE: Empowerment, capacity building and social preparation: activities for individual and resource user group empowerment and skills development to actively participate in co-management							
I.2.C.3.1	INDICATOR: There are active skill development programmes for enhancing capacity building for fishers to participate in co-management activities at community level	Review of activity programme; Review of training/skills development programmes; Review of training needs assessment (if any)						
I.2.C.3.2	INDICATOR: There is a basic understanding among participants about the purpose and operation of the co-management system	Questionnaire survey						
I.2.C.4	GOOD PRACTICE: Coordination: forum (meeting or assembly) for cooperation between government and resource users							
I.2.C.4.1	INDICATOR: A forum for coordination and cooperation of government and resource users is operational	Review of institutional structures and meeting minutes; Review on the mechanisms of horizontal and vertical coordination in place						
I.2.C.4.2	INDICATOR: There are regular meetings between government and resource users	Review of meeting minutes; Review on the mechanisms of horizontal and vertical coordination in place						
I.2.C.5	GOOD PRACTICE: Community organizations: existence of a legitimate (as recognized by the local people) community or people's organization for representing resource users and other stakeholders in decision-making							
I.2.C.5.1	INDICATOR: A legitimate (as recognized by the local people) organization representing resource users and other stakeholders in decision-making is in place	Review of institutional structures and meeting minutes; Questionnaire survey (perception); Review of formal documents/endorsement papers relating to the establishment of the organization						

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.C.5.2	INDICATOR: A legitimate (as recognized by the government) organization representing resource users and other stakeholders in decision-making is in place	Review of institutional structures and meeting minutes; Questionnaire survey (perception); Review of formal documents/endorsement papers relating to the establishment of the organization						
I.2.C.6	GOOD PRACTICE: Equity: equal opportunity and fair access to the fishery among the various resource users and between different user groups							
I.2.C.6.1	INDICATOR: Different resource user groups have equal opportunities to participate in and benefit from the co-management system	Questionnaire survey; focal group discussions (perceptions); Focal group discussions with excluded/non-participating resource users/groups						
I.2.C.7	GOOD PRACTICE: Inclusiveness: recognition and involvement of different resource users and community members, including youth, women, Indigenous Peoples and others with a stake in the future of the fishery							
I.2.C.7.1	INDICATOR: Different legitimate resource user groups, including youth, women and Indigenous Peoples, are recognized as stakeholders in the co-management and have equal opportunities to participate in the co-management arrangement	Questionnaire survey; Focal group discussions; Questionnaire survey (perception); Focus group discussion with excluded/non-participating resource users/groups						
I.2.D	RULE OF LAW							
I.2.D.1	GOOD PRACTICE: Congruence: scale and scope of rules are appropriate to local conditions							
I.2.D.1.1	INDICATOR: There are rules and regulations for fisheries management	Review of co-management plan						
I.2.D.1.2	INDICATOR: Scale and scope of rules and regulations fit local conditions and are well defined in a participatory way	Review of co-management plan; Focus group discussions						

Annex 1. Assessment sheet for the evaluation of the design and performance of the fisheries co-management system

Nr.	Good practice & indicator	Examples of approaches for measuring indicators	Scoring (existence of good practice)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
I.2.D.2	GOOD PRACTICE: Management rules enforced: self-enforcement system of penalties imposed by strong operational rules designed, enforced and controlled by local users							
I.2.D.2.1	INDICATOR: Self-enforcement system of penalties is designed by resource users/co-management participants	Review of documentation on enforcement system; Focal group discussions; Review of the mechanism of sanctioning of violations and active participation of the authorities in the process						
I.2.D.2.2	INDICATOR: There is an active patrolling and enforcement mechanism in place and operational	Review of documentation on enforcement system; Focal group discussions; Review of the effectiveness/regularity of the patrolling routines						
I.2.D.3	GOOD PRACTICE: Graduated sanctions: sanctions increase with the number or the severity of offences							
I.2.D.3.1	INDICATOR: Sanctions are proportional to the number or severity of offences	Review of documentation of sanctions; Questionnaire survey (perception)						
I.3	INDIVIDUAL AND HOUSEHOLD LEVEL							
I.3.1	GOOD PRACTICE: Individual incentive structure: individual incentive structure (economic, social, political) that induces individuals to participate in co-management							
I.3.1.1	INDICATOR: Individuals have incentives (economic, social, political) to participate in co-management and voluntarily comply with co-management rules and decisions	Questionnaire survey (perception); Focal group discussions; Interviews with key informants; Focus group discussion with excluded/non-participating user groups						
I.3.1.2	INDICATOR: Incentives from government are available for individuals and stakeholder groups to positively participate in co-management	Review of government programmes; Questionnaire survey; Interviews with government key informants						

Annex 2. Assessment sheet for the evaluation of achievement of goals and objectives of the fisheries co-management plan

The evaluation of a fisheries co-management plan is based on indicators to assess the performance of fisheries co-management and whether the goals and objectives, as stated in the fisheries co-management plan, have been achieved. For the evaluation of the fisheries co-management plan there are four groupings of indicators (social, economic, ecological and governance) to be evaluated associated with the four types of goals and objectives found in a co-management plan. Each of the four groupings of indicators is used to measure the performance of the fisheries co-management system in achieving its goals and objectives. Social indicators will include, for example, equity, accountability, and sustainability. Economic indicators will include, for example, efficiency and economic development. Ecological indicators will include, for example, harvest, resilience, biodiversity and biological sustainability. Governance indicators will include, for example, organizations, rules, networking and participation.

There are hundreds of potential indicators that can be used for a co-management plan evaluation. The indicators on the assessment sheet below are not meant to be prescriptive. They are recommended or suggested indicators for the evaluation. This list of indicators is not meant to be completely exhaustive (closed) in order to avoid overlooking goals and objectives that are specific to a fisheries co-management plan. There is no one set of indicators that is applicable or appropriate to all fisheries co-management plans, or that must be used in an evaluation. The user of this Guidebook is encouraged to develop other indicators that are more applicable and appropriate for the evaluation of their fisheries co-management plan.

As presented in Step 3 above, the assessment sheet is used to guide the data collection, measurement and analysis of indicators to evaluate the fisheries co-management plan.

Assessment sheet for the evaluation of achievement of goals and objectives of the fisheries co-management plan

Name of fisheries co-management system: _____

Nr.	Type of goals and objectives and indicators	Examples of approaches for measuring indicators	Scoring (achievement)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
II.1	SOCIAL GOALS AND OBJECTIVES (examples include benefits from fisheries equitably distributed; compatibility between management and local culture maximized; environmental awareness and knowledge enhanced)							
II.1.1	INDICATOR: The co-management approach and measures represent the range of interests of different stakeholders and accommodate the full diversity of those interests	Review of management plan document; Questionnaire survey (perception); Focus group discussions with stakeholder groups						
II.1.2	INDICATOR: Equitable management that represents the range of interests of stakeholders and accommodates the full diversity of those interests	Questionnaire survey (perceptions); Focus group discussions with stakeholder groups						
II.1.3	INDICATOR: Indigenous and local knowledge is explicitly reflected in the fisheries co-management plan	Review of management plan document; Questionnaire survey (perception); Interviews with key informants (from non-participating/excluded/minorities resource users)						
II.1.4	INDICATOR: There is support for co-management among different stakeholder groups	Questionnaire survey (perceptions) among stakeholder groups identified in the stakeholder analysis (carried out in evaluation Step 1); Focus group discussions with stakeholder groups						
II.1.5	INDICATOR: Diversity of gender, youth and ethnicity aspects have been integrated in the co-management committee	Review co-management committee composition and the roles/powers of different members; Review of the selection/election mechanism; Interviews with key informants from different user groups						
II.1.6	INDICATOR: Tenure and access rights are fairly allocated	Review of government agreement and tenure arrangements; Questionnaire survey (perception) among different resource users along the value chain						

Annex 2. Assessment sheet for the evaluation of achievement of goals and objectives of the fisheries co-management plan

Nr.	Type of goals and objectives and indicators	Examples of approaches for measuring indicators	Scoring (achievement)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
II.1.7	INDICATOR: Social learning (collective knowledge, shared values) is enhanced	Questionnaire survey; Focal group discussions (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.1.8	INDICATOR: Local values and beliefs about marine resources are enhanced	Questionnaire survey; Focal group discussions (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.1.9	INDICATOR: The co-management provides social benefits to stakeholders	Questionnaire survey (perception) covering different stakeholder groups (including, women, youth, vulnerable groups)						
II.2	ECONOMIC GOALS AND OBJECTIVES (examples include livelihoods enhanced or maintained; food security and nutrition enhanced or maintained; increased incomes)							
II.2.1	INDICATOR: Seafood availability and access have increased at household/ community/market levels	Observation; focal group discussions (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.2.2	INDICATOR: Benefits of operating and maintaining co-management arrangements exceed the costs	Financial analysis based on co-management accounts						
II.2.3	INDICATOR: There are incentives for stakeholders to support co-management	Questionnaire survey (perception); Focal group discussions						
II.2.4	INDICATOR: Co-management has benefited stakeholders economically	Questionnaire survey; Focus group discussions with stakeholders to aggregate data per groups (capture fishers, fixed gear operators, aquaculture farmers)						
II.2.5	INDICATOR: Fish catches have improved overall in the co-managed fishery or area	Catch and landings data survey; Focal group discussions (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						

Nr.	Type of goals and objectives and indicators	Examples of approaches for measuring indicators	Scoring (achievement)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
II.2.6	INDICATOR: Co-management participants have a higher level of material lifestyle (housing, household goods, etc.)	Focal group discussion; Questionnaire survey (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.2.7	INDICATOR: Number of sick days among co-management participants	Focal group discussion; Questionnaire survey (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.2.8	INDICATOR: Incomes/benefits are fairly distributed between men and women	Focal group discussion; Questionnaire survey (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.3	ECOLOGICAL GOALS AND OBJECTIVES (examples include fisheries resources exploited at sustainable levels; resilient ecosystems secure multiple services to local communities; essential fish habitats well protected)							
II.3.1	INDICATOR: There is abundance of key focal species	Observations (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.3.2	INDICATOR: Fish catches have improved overall in the co-managed fishery or area	Catch and landings data survey; Focal group discussions (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						
II.3.3	INDICATOR: Previously destroyed habitats show signs of recovery	Observations (requires a baseline to compare with, either from earlier evaluation/survey or asking respondents to compare with how they remember the situation was earlier)						

Annex 2. Assessment sheet for the evaluation of achievement of goals and objectives of the fisheries co-management plan

Nr.	Type of goals and objectives and indicators	Examples of approaches for measuring indicators	Scoring (achievement)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
II.3.4	INDICATOR: Management measures for fisheries management are appropriate and operational	Review co-management plan (fisheries management plan); Focal group discussions; Review co-management operational procedures through interviews with government/management and executive/management board key informants						
II.3.5	INDICATOR: The EAF is an integral part of the fisheries management plan	Review co-management plan (fisheries management plan)						
II.3.6	INDICATOR: Resource users/co-management participants take an active role in monitoring compliance with agreed regulations	Review of compliance/enforcement arrangements (documentation in co-management plan, existing institutional structures); Review co-management operational procedures through interviews with government/management and executive/management board key informants						
II.4	GOVERNANCE GOALS AND OBJECTIVES (examples include effective co-management structures and strategies maintained; effective stakeholder participation and representation ensured; resource use conflicts managed and reduced)							
II.4.1	INDICATOR: Effective co-management institutions (committee, administrative team) and related important structures (professional organizations) are in place and functional	Review of co-management documentation (meeting minutes, etc.); Focal group discussions; Questionnaire survey (perception)						
II.4.2	INDICATOR: There is a co-management plan and it contains key provisions and clear goals and objectives	Review of co-management plan						
II.4.3	INDICATOR: The degree of legitimacy of the management system with stakeholders increased	Focal group discussions; Questionnaire survey (perception)						
II.4.4	INDICATOR: Decision-making is transparent to all stakeholders and decision-makers are accountable	Focal group discussions; Questionnaire survey (perception)						
II.4.5	INDICATOR: All main stakeholders are empowered and capable to actively participate in decision-making	Focal group discussions; Questionnaire survey (perception)						

Nr.	Type of goals and objectives and indicators	Examples of approaches for measuring indicators	Scoring (achievement)				Comments/ explanations	Data collection method and source
			Yes	Partly	No	Not applicable		
II.4.6	INDICATOR: Conflict management mechanism is in place and documented	Review of co-management documentation; Analysis of formal versus informal mechanisms, traditional versus legal/modern mechanisms						
II.4.7	INDICATOR: Conflict management mechanism is contributing to reducing the number of conflicts between different resource user groups/stakeholders	Review of incident reports and complaints to police, community leaders or other instances addressing conflicts; Analysis of frequency (number) and type of conflicts						
II.4.8	INDICATOR: Self-enforcement system of penalties is designed by resource users/ co-management participants	Review of documentation on enforcement system; Focal group discussions						
II.4.9	INDICATOR: Networks and alliances among various user groups/stakeholders are in place and functional	Review of registered organizations and their memberships; Questionnaire survey among stakeholders on their organizational memberships						
II.4.10	INDICATOR: Different legitimate resource user groups, including youth, women and Indigenous Peoples, are recognized as stakeholders in the co-management and have equal opportunities to participate in the co-management arrangement	Questionnaire survey; Focal group discussions; q Questionnaire survey (perception)						
II.4.11	INDICATOR: There is a formal legal framework regulating fisheries co-management	Review of legislation; Questionnaire survey (perception)						

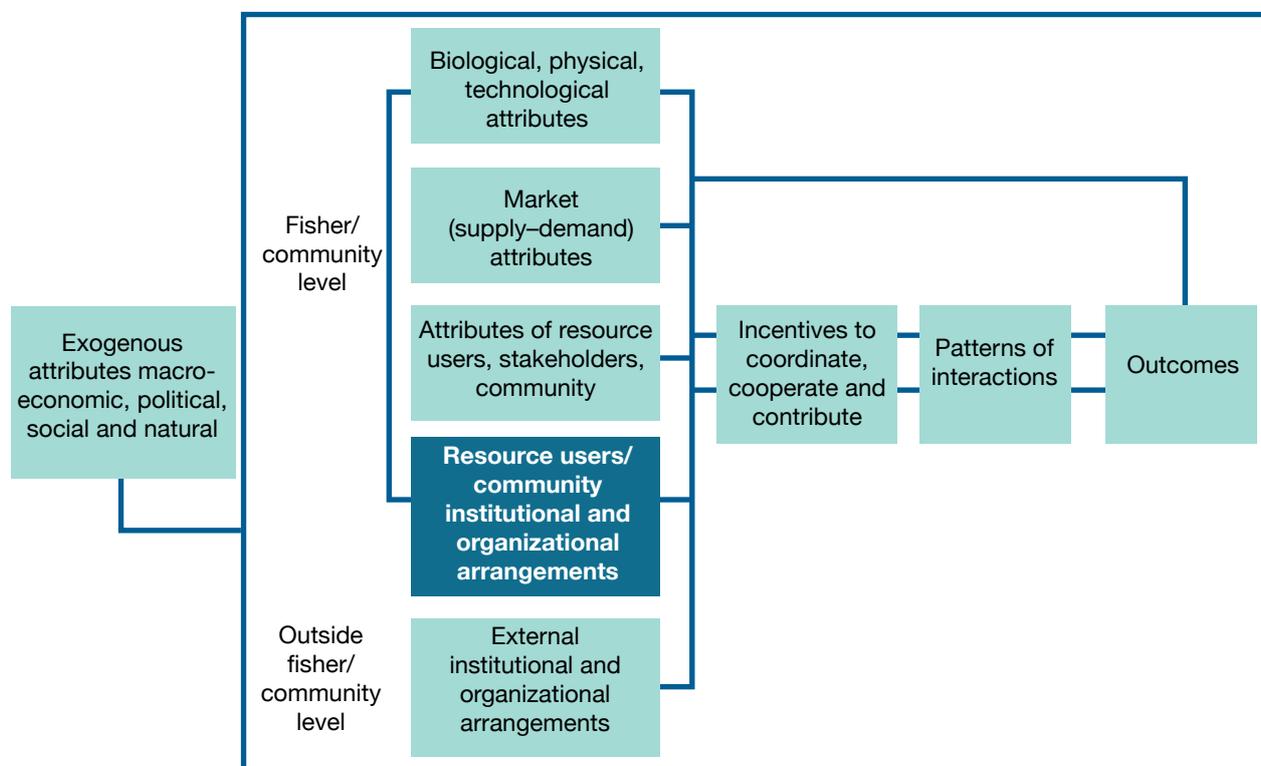
Annex 3. Analytical framework

The IAD framework was developed at the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis at Indiana University beginning in the early 1980s (Ostrom, 1990; McGinnis, 2000, 2011; Ostrom, 2005, 2011; Poteete *et al.*, 2010). The IAD framework allows for the essential elements of an “action situation”, in which actors (acting on their own or as agents of formal organizations) interact with each other and thereby jointly affect outcomes to be identified and examined. The actors seek to achieve goals for themselves and for their communities but do so within the context of ubiquitous social dilemmas and biophysical constraints, as well as cognitive limitations and cultural predispositions (McGinnis and Ostrom, 2014).

The institutional analysis focuses on how rules combine with various contextual variables to structure the action situation and to generate particular types of outcomes. The analysis begins with an identification of variables affecting the action situation; the institutional, biophysical, technological, market, sociocultural, economic, and political attributes and conditions of the resource users and the resource. These variables form the context within which resource users, other stakeholders and authorities coordinate and cooperate to establish institutions and organizations to govern, manage and use the resources.

In analysing institutional arrangements, the basic strategy is to separate and dissect the parts of the action situation – contextual variables, incentives, patterns of interactions and outcomes (Figure A3.1). The purpose of this is to examine relationships between and among the parts. Each part of the framework has a causal relationship with other parts, some stronger and some weaker depending upon the involvement of human choice in the relationship. Biophysical and technological attributes can have a direct effect on outcomes, for example, high levels of fishing effort can lead to overexploitation of resources, regardless of whether or not institutional arrangements are in place. Institutional arrangements, on the other hand, have an indirect effect on outcomes as they lead to changes in human behaviour and choice, which affect interactions and outcomes (Oakerson, 1992). Different combinations of these parts can be examined depending upon the situation. These relationships can be analysed forward or backward depending upon if one is using the framework as an evaluative, diagnostic or design tool. Explicit and implicit assumptions about the relationships help structure and guide the analysis.

Figure A3.1 Institutional analysis and development framework



Source: ICLARM & IFM (International Centre for Living Aquatic Resources Management and Institute for Fisheries Management and Coastal Community Development). 1998. *Analysis of co-management arrangements in fisheries and related coastal resources: A research framework*. Manila and Denmark, ICLARM and IFM.

In a short-run analysis of an action situation, the contextual variables are assumed to be unchanging. Over a longer period, however, change will occur in them. Yields may increase, gear type may change or the day-to-day rules may be restructured. A dynamic element can be introduced into the framework. One approach treats institutional changes as exogenous; the aim is simply to understand how a series of changes in resource attributes or institutional arrangements affects patterns of interaction and outcomes. Another approach examines long-term relationships between attributes and institutional arrangements in an iterative and causal fashion. For example, outcomes can affect patterns of interactions resulting in a process of learning by the resource users; causing, in turn, individuals to modify their strategies. These relationships can be traced through the framework to identify factors which cause the strategies to change (Oakerson, 1992).

The framework enables the following analysis:

1. Institutional arrangements analysis: This component links contextual variables characterizing key attributes of the resource (biological, physical) and the resource users (technology, market, social, cultural, economic, political) with the management institutional arrangements (rights and rules). The contextual variables are each composed of several attributes. A causal relationship exists among and between the contextual variables, the institutional arrangements (the focus of

the analysis) and the resulting transactional (action) situations. The institutional arrangements and the contextual variables affect the actions of the resource users and authorities responsible for fisheries management by shaping the incentives and disincentives they have to coordinate and cooperate in resource governance, management and use; the incentives, in turn, shape the patterns of interaction and behaviour between the co-management partners, i.e. the types of co-management arrangement established and the way it functions.

2. Co-management performance analysis: The co-management arrangement results in outcomes. These outcomes will, in turn, affect contextual variables as well as the behaviour of resource users, other stakeholders and public authorities (indicated by dotted line in Figure A3.2). Time is a critical element. All the contextual variables can change through time. This may cause change in institutional arrangements which, in turn, affect incentives, patterns of interaction and outcomes. The outcomes of co-management institutional arrangements can be evaluated in terms of e.g. management efficiency, equity and sustainability of resource utilization.
3. Characteristics of successful co-management institutional arrangements: The most important aspect of this analysis is the specification of what conditions and processes bring about successful, long-enduring, fisheries co-management arrangements. From the analysis we can identify a list of principles and propositions about conditions and processes.

The IAD framework was designed for application to any type of policy situation in which individuals and communities craft new policies as partial solutions for changing policy problems. When applied to resource management issues, the natural tendency within the IAD framework is to treat the dynamics of a resource system as a mostly exogenous force, that is, as a driver of changing circumstances and not something directly under the control of the actors making policy in those settings. This separation between natural processes as drivers and policy processes as the core analytical concern make the IAD framework seem directly relevant to the dynamics of complexly coupled human–natural or social–ecological systems.

In extensive work on such topics as urban governance, groundwater, irrigation systems and forestry resources, the IAD framework has proved useful for analysis of complex social systems. The first application of the IAD framework for fisheries was through a global fisheries co-management project implemented by the International Centre for Living Aquatic Resources Management (ICLARM) and the Institute for Fisheries Management and Coastal Community Development (IFM) in Denmark (ICLARM and IFM, 1998). The aim was to provide a common analytical framework which would enable comparison between case studies, country research and co-management models. This will allow data to be analysed in a systematic way and allow generalizations to be made about conditions which facilitate successful co-management.

Social–ecological systems framework

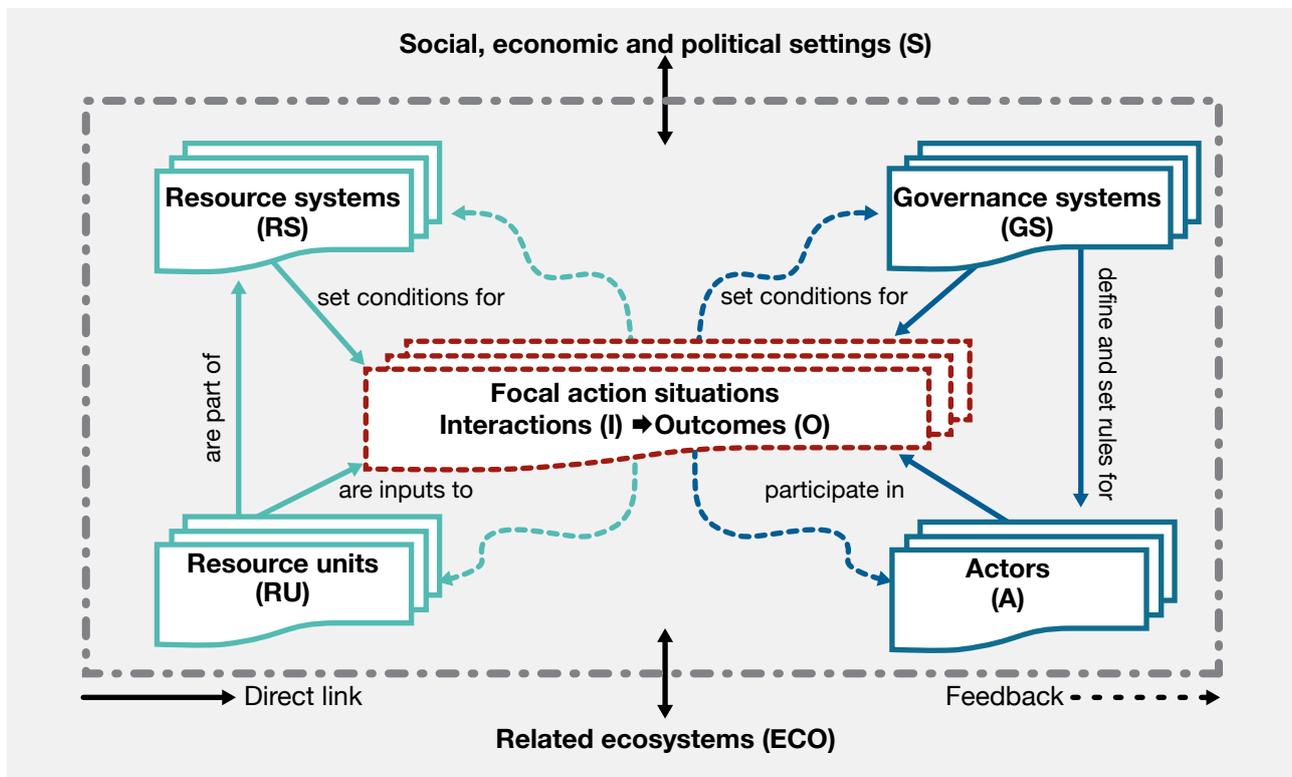
The SES framework builds on the foundation of the IAD framework, and the two are very closely related. Ostrom’s (2009) framework for analysing social–ecological systems involves four core systems and a large number of variables falling under the core systems. Ostrom’s framework (McGinnis and Ostrom, 2014; Ostrom, 2009, 2007) provides a coherent and robust set of variables to analyse how the attributes of a resource system, the resource units, the users and the governance system affect interactions and resulting outcomes (d’Armenegol *et al.*, 2018).

All humanly used resources are embedded in complex, social–ecological systems (Berkes and Folke 1998; Ostrom, 2009). SESs are composed of multiple subsystems and internal variables within these subsystems at multiple levels. In a complex SES, subsystems such as a resource system (e.g. a coastal fishery), resource units (e.g. lobsters), users/actors (fishers), and governance systems (organizations and rules that govern fishing on that coast) are relatively separable but interact to produce outcomes at the SES level, which in turn feedback to affect these subsystems and their components, as well other larger or smaller SESs (Ostrom, 2009).

As McGinnis and Ostrom (2014) state: the SES framework was originally designed for application to a relatively well-defined domain of common-pool resource management situations in which *resource users/actors extract resource units from a resource system*. The resource users/actors also provide for the maintenance of the resource system according to rules and procedures determined by an overarching *governance system* and in the context of *related ecological systems and broader social–political–economic settings*. The processes of extraction and maintenance were identified as among the most important forms of interactions and outcomes that are located in the very center of this framework (Ostrom 2007, 2009). The italicized terms serve as first-tier categories in the SES framework. Potential variables or indicators are included as second-tier variables. More detailed variables or empirical indicators are located at lower tiers in this ontological framework.

The social–ecological system framework is shown in Figure A3.2 (McGinnis and Ostrom, 2014). Resource systems, resource units, governance systems and actors (solid boxes) are the first-tier variables that contain multiple variables at the second tier as well as lower tiers. Action situations are where all the action takes place as inputs are transformed by the actions of multiple actors into outcomes. Dashed arrows denote feedback from action situations to each of the top-tier categories. The dotted-and-dashed line that surrounds the interior elements of the figure indicates that the focal SES can be considered as a logical whole, but that exogenous influences from related ecological systems or social–economic–political settings can affect any component of the SES. These exogenous influences might emerge from the dynamic operation of processes at larger or smaller scales than that of the focal SES.

Figure A3.2 Social–ecological system framework



Source: McGinnis, M.D. & Ostrom, E. 2014. Social-ecological system framework: initial changes and continuing challenges. *Ecology and Society*, 19(2): 30.

Building from Ostrom's (2009) original set of second-tier variables, McGinnis and Ostrom (2014) report on a new set of second-tier variables that affect the likelihood of self-organization in efforts to achieve a sustainable SES. This long list will not be repeated here but can be seen in the article by McGinnis and Ostrom (2014).

d'Armengol *et al.* (2018) utilized and adapted this framework for a study of small-scale fisheries co-management. Their analytical framework contains: 1) basic information, 2) context, 3) co-management attributes, and 4) outcomes. Basic information includes key geographical and ecological descriptors of the fishery, while context variables refer to the resource system, resource unit, governance system and users. Co-management attributes are split across five categories (including Ostrom's interactions variables): co-management features, interactions and decision-making, participation, networks and adaptive management. Finally, outcomes encompass another four groupings: ecological, process, socioeconomic and generic outcomes, each containing some self-added variables specific to small-scale fisheries' co-management. They excluded from their analysis the two sets of variables from Ostrom's framework that refer to related ecosystems and social, economic and political settings (e.g. climate trends, economic development or demographic trends, among others) since they were not relevant to their study. The specifics can be seen in the article (d'Armengol *et al.*, 2014).

Annex 4. Attributes relevant to describing the co-management context (Task 2.1)

Biological, physical and technical attributes

1. Type of ecosystem (marine, inland, coast, coral reef, seagrass, mangrove, estuary, lake, river, floodplain, etc.);
2. Boundaries (physical, administrative, restrictions in access to fish resources);
3. Health status of fish habitats (spawning areas, nursery areas, fishing grounds);
4. Characteristics of target fish species and stocks (migratory or sedentary; status of stocks);
5. Characteristics of fisheries (industrial, artisanal, fishing technologies used, physical range of fishing operations, seasonal variations in fishing activities, level of exploitation);
6. Post-harvest utilization of catches (fresh, salted, dried, smoked, fermented, frozen, canned, etc.);
7. Terrestrial uses (residential, retail, industrial, tourism, etc.);
8. Other relevant coexisting fishing activities (external to the co-management arrangement); and
9. Other human uses of the ecosystem.

Market attributes

1. Market orientation of the fisheries (local, regional, national, international markets);
2. Value of fish products (high or low value market);
3. Market structure (many or few suppliers/buyers, market dominance, power relations between suppliers and buyers, interdependencies);
4. Market functions (processing, storage, transportation);
5. Market infrastructure (ice, landing site, wholesale/retail market, etc.);
6. Length of supply chain from fisher to final consumer;
7. Product certification schemes (if applicable);
8. Nature of first sale (compulsory centralized auction, direct selling to end consumers by fishers, etc.);
9. Mean annual landings; and
10. Mean value of landings/kg.

Socioeconomic and sociocultural attributes

1. Demographics (residency status, ethnicity, religion, gender, age, education, family size, migrants);
2. Homogeneity/heterogeneity of fishers, fish traders, fish processors and other stakeholders (ethnicity, religion, fishing gear use, gender, ownership of boats and fishing gear);
3. Dependency on fisheries/fish trade/fish processing for livelihood; other sources of income/subsistence;
4. Livelihoods (occupations, sources of income);
5. Economic status (assets, wealth ranking, poverty);
6. Local and Indigenous knowledge relevant to fisheries management (ecological and biological knowledge of resources and habitats, knowledge of catchability and fishing technologies);
7. Cultural factors affecting community or group attitude to fisheries/fish trade/fish processing and determining behaviour of individuals/groups;
8. Resource use patterns (land and water-based activities such as fishing, location of activity);
9. Community infrastructure and services;
10. Level of knowledge, attitudes and practices relevant to fishery; and
11. Political affiliations.

Institutional and organizational arrangements attributes

1. Power structures and leadership (role, functioning and importance of traditional leadership structures in decision-making inside/outside the fisheries sector, gender);
2. Organizations established/appointed to serve as co-management partner (legal basis, mandate, representation, decision-making system/procedures, mechanisms for implementation of management decisions/enforcement);
3. Tenure arrangements;
4. Local regulation of access to fish resources (principles for allocation of fishing rights or for exclusion of groups or individuals);
5. Operational and collective choice rules and management measures in place concerning fish catch, fish trade and fish processing, including origin of rule;
6. Legitimacy of institutional arrangements and organizational set-up involving fishers and other stakeholders; attitudes towards co-management; and
7. Conflicts and mechanisms for conflict resolution among resource users.

External institutional and organizational arrangements attributes

1. Overall structure of national political and administrative system (relation between legislative and administrative system; centralization/decentralization);
2. Department of Fisheries and other relevant organizational structures involved with fisheries management (mandate and legal basis, structural organization, management function and tasks at national, provincial, district etc., levels);
3. Legal basis for co-management arrangements (enabling legislation, administrative decree, other);
4. Government agencies outside the fisheries sector whose mandate and activities interfere with or impact on fisheries;
5. Power structures outside the fishing communities which impact on local power structures and leadership (e.g. influence of political leaders, high ranking military or police chiefs);
6. Role of donor organizations in promoting/enabling co-management arrangement;
7. Non-governmental organizations; and
8. External multilateral and transboundary agreements.

Exogenous (macroeconomic, social, political, natural) attributes

1. Political and economic context of co-management arrangement (change in political system and overall economic development since colonial time; major events which impact on the survival of institutions [e.g. market liberalization]);
2. Disasters/calamities caused by war/civil unrest, typhoons/cyclones, earthquake, flooding, etc. which impact on the survival of institutions; and
3. Climate change.



The *Guidebook for evaluating fisheries co-management effectiveness* offers a process and method to evaluate the performance of a fisheries co-management system and its plan in order to enhance its effectiveness in delivering benefits and in contributing to environmental, social and economic sustainability and good governance. It is to be used to evaluate the effectiveness of an existing fisheries co-management system operating at a fishery, community or sector level, or in a spatially defined area. It presents a flexible approach that can be used in many types of fisheries co-management systems with different contexts and characteristics.

